Sustainable Accessibility for All

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Acknowledgements

Table of contents

Figures

Tables

Boxes

Executive summary

Key messages

Accessibility requires broader framing

Physical access is a crucial component of accessible transport services. But accessibility involves an intersection between many different policy areas and frames of reference. Focusing on one aspect is not sufficient to guarantee accessibility for all.

People need sustainable options

People need opportunities to be available and accessible, and they need sustainable travel options to access them for sustainable accessibility to be a reality. Additionally, policies targeted at travel choices may be needed to change travel behaviours.

Engage effectively with communities

To improve engagement with the people impacted by transport interventions, policy makers should consider a wide variety of citizen participation processes. The exact form of these processes will depend on what is most appropriate for the context.

Main findings

This report, aimed at policymakers and transportation planners, explores the concept of sustainable accessibility for all. It argues that traditional approaches to accessibility, focused solely on physical mobility, are insufficient. The report highlights the importance of access to opportunities and calls for a broader, more integrated approach that considers land use, social factors, and sustainable travel options.

Accessibility involves an intersection between many different policy areas: not only physically accessing mobility, and *how* people access opportunities, but also *what* those opportunities are and the policies (such as land-use policies) that affect *where* they are, *when* are they accessible, as well as *who* is (or is not) willing and able to access them. Conventional frames for considering accessibility are too narrow. While they help advance understanding, they are a long way from ensuring accessibility for all. Single frames ignore the intersection of experiences that affect people's ability to access opportunities but also their travel behaviour when accessing available opportunities – a crucial aspect of sustainable travel.

While standards exist for physical access, the level of intersections that impact accessibility means that it is not likely to be something that can be universally generalised. It will more likely need to be dealt with progressively at different stages of the governance and planning processes. Accessibility needs to be considered in terms of access to opportunities and how that is influenced by a combination of factors of the communities themselves and the areas in which they live. Transport policy is not the only lever to pull to enable sustainable accessibility. Many of the solutions we already know from years of work on access for persons with disabilities still hold true and need to be acted upon.

The objectives also need to be clear – both sustainability and accessibility can be addressed through interventions, but the actions may vary. For example, the installation of a new sustainable mobility service that increases accessibility for those disadvantaged by the pre-existing transport system may also need to be accompanied by incentives or other measures to encourage a change of behaviour among those choosing to use less sustainable alternatives.

Sustainable accessibility governance will require different actions at different levels. National governments must lead the way by identifying sustainable accessibility as a strategic priority, legitimising budget allocations for that purpose. Different levels of government have different competencies and relevance to the desired outcomes. National governments can set agendas and strategic priorities for investment (either directly or in conjunction with local entities), but local authorities are likely to be better placed to understand the circumstances facing the residents, commuters and visitors in their region.

To improve engagement with the people impacted by interventions, policymakers should consider the tools available in the OECD guidance on citizen participation processes. The exact form of participatory processes will depend on what is most appropriate for the context. Tools exist to consult citizens at a high level on strategies or strategic interventions. Equally, community level schemes can inform project designs and investments at a more local level. Through engagement at these two levels of governance, firstly strategic direction can be given and, potentially, funding defined. At a more local level, specific projects or interventions could be identified that will help accessibility in those communities – given the combination of socio-economic, demographic and territorial factors that prevail in that setting.

Top recommendations

Clearly identify accessibility to opportunities as a priority in national strategies

Providing and improving accessibility to amenities and opportunities must be identified as a priority by national government so it can feed into all strategies, governance frameworks or planning processes that follow. Building on section 1, these strategies must include more than just the transport sector and should reflect integrated thinking with land use and local development. Including the need to consider different social groups in relevant engagement should also be prioritised. It will be important that the most appropriate governance level is involved at each step – for example, for strategic planning, oversight, and funding, the national ministry may be best placed, but for detailed planning and implementation, the local authorities should lead the process.

Broaden accessibility considerations beyond conventional frames of gender, age and physical mobility

Efforts to better understand transport users' travel patterns and needs are a positive step forwards in breaking conventional transport planning habits that have tended to underserve segments of the community. This work has also helped raise awareness of the need to change and there is a considerable body of research on many of the individual factors. However, for the translation of that knowledge to implementable solutions, a greater understanding of the specific circumstances facing a given population are an essential element to successful outcomes – especially if projects seek to address both accessibility and sustainability. This could include potentially seeking out new data sources and increasing engagement.

Adopt available methodologies to improve engagement with affected communities

Empowering communities to be a part of the solutions for their accessibility can help with greater understanding and more appropriate solution design. There are many examples of the deployment of

participative processes for transport projects from strategy and budgeting to project design and routing. There are established engagement processes that the transport sector could adopt, many of which are outlined in the OECD's guidelines on citizen participation.

Develop accessibility indicator methodologies suitable to the end purpose

Accessibility indicators can help to identify and communicate gaps in access to opportunities for different communities or social groups. There is not currently consensus on a single "best" methodology, but different dimensions can be included depending on the size of the area covered and the granularity of the data available. The inclusion of more complex person-based metrics will most likely lend itself to more local planning. However, methodologies need to be developed to reflect accessibility of rural and remote areas, as well as urban contexts. Combining the indicators with sustainable mobility frameworks or modal hierarchy will help to include the sustainable aspect of sustainable accessibility.

Adopt a comprehensive approach to accessibility planning – include more than just mobility policies

Accessibility cannot be solved by transport policy alone. Proximity to opportunities supports accessibility and access by sustainable modes. Improving quality of urban space, walkability and cyclability can reinforce this. Furthermore, alternatives to travel can also support accessibility, such as virtual access, which is important also to improving accessibility without increasing transport demand. These aspects rely on non-transport policy domains and infrastructure that can differ by geographical type. Comprehensive planning that reflects the desired outcomes, as well as stronger cross-agency collaboration in government, will be needed to support sustainable accessibility.

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1. What is sustainable accessibility for all?

Although the idea of "accessibility" is not new, the topic has become increasingly important in transport policy discourse in recent years. This reflects a shift in emphasis from mobility, in which more and faster travel is better, to access to opportunities, where travel enables people to fulfil their needs (ITF, 2012; 2021). As part of this discourse, discussions about physical transport networks and services have given way to examinations of the people and places these networks do (or do not) serve.

At the same time, the concept of accessibility has grown beyond physical access and mobility. Accessibility is now a core concern across multiple policy fields besides transport – proximity, land-use planning and alternative forms of access (e.g. digital access) all engage with elements of accessibility. However, despite a significant body of knowledge on accessibility and transport poverty, there is an absence of comprehensive policy implementation based on this knowledge.

There are several widely accepted definitions, or components, of accessibility. Expanding the concept of accessibility by incorporating "sustainability" means taking additional considerations into account. For example, people's choice of transport modes and vehicle types affects the costs their travel and behaviour impose on society (e.g., air pollution, climate change and exclusion). This report adopts a non-exhaustive definition of "sustainable accessibility" (see Box 1) that seeks to cover the various aspects that need to be addressed in translating research and knowledge into policy.

Many of life's inequities play out in the transport space. When transport is unaffordable, physically and digitally inaccessible, unsafe and insecure, it directly affects people's ability to find employment or education, participate socially, access healthcare and essential services, and improve their quality of life. But what constitutes a viable opportunity or transport option will vary from person to person. This is why transport policies focusing on accessibility "explicitly recognise the need to deliver benefits to all social groups, implying an allocation of resources favouring those who have the fewest opportunities" (ITF, 2020).

Box 1. A working definition of sustainable accessibility

Sustainable accessibility is the ease of reaching amenities and opportunities.

It depends on the presence of:

1. opportunities across settlement types and times of day

2. attractive sustainable mobility options (or alternatives) that are reliable, affordable, usable and non-discriminatory.

Policy makers need better guidance and principles to help frame the myriad decisions they must make when ensuring accessibility for their populations. Furthermore, two objectives are at play when seeking sustainable accessibility. The first is the threshold condition of providing access to opportunities to avoid access poverty. The second is encouraging travellers and policy makers to move away from choosing or prioritising unsustainable transport modes such as private cars, especially petrol and diesel cars. This objective focuses on encouraging or enabling people and policy makers to think about access to opportunities using sustainable modes, particularly low-carbon and inclusive modes such as active travel.

A Sustainable Accessibility for All framework

As a starting point, this report proposes a conceptual framework for understanding the different facets of sustainable accessibility for all (see Figure 1). Its three main dimensions echo the concepts of "accessibility", "sustainability" and "for all". The remainder of the report then explores the factors that influence the necessary actions and governance for planning sustainable accessibility policies.

Accessibility

Accessibility encompasses the ease of independently reaching amenities and opportunities (e.g. housing, work, education, recreation, essential services, and social contacts) provided primarily through land use and the transport system (Cass et al., 2005; Geurs and Wee, 2004; Fol and Gallez, 2013).

Land-use and planning parameters include settlement types, the balance between existing and needed infrastructure, the territorial distribution and proximity of services and amenities, the level and quality of local facilities, and opening times.

The transport system encompasses the existing and needed infrastructure for mobility, walkability, bikeability; existing and needed public transport and mobility services and level of service provided (spatially and temporally); fares, information, reliability, travel time and timetables.

Mobility provides a degree of freedom of movement to realise accessibility, but enhanced mobility alone will not increase accessibility. A person lacking accessible mobility options may still have a high level of mobility. Mobility itself is not necessarily desirable: it can even act as a substitute for local accessibility. Moving around less and having better accessibility is both desirable and possible.

The framework integrates these parameters. It seeks to articulate spatial and transport planning policies and strategies to address existing barriers to travel. In this framework, addressing the needs of different societal groups also presents opportunities to captivate users and non-users of mobility options alike.

Sustainability

The sustainability element includes not only the environmental dimension of transport (e.g. transport emissions) but also social and economic dimensions such as the ways in which transport presents barriers and opportunities for particular social groups and settlement types.

For all

The framework captures the societal/user dimensions that must be considered before, during and after implementation processes. This dimension incorporates the iterative process of considering the different societal groups – reflecting social, demographic, cultural and economic factors – and their representation among transport user groups as well as barriers preventing or limiting transport access.

Figure 1. A conceptual framework for Sustainable Accessibility for All
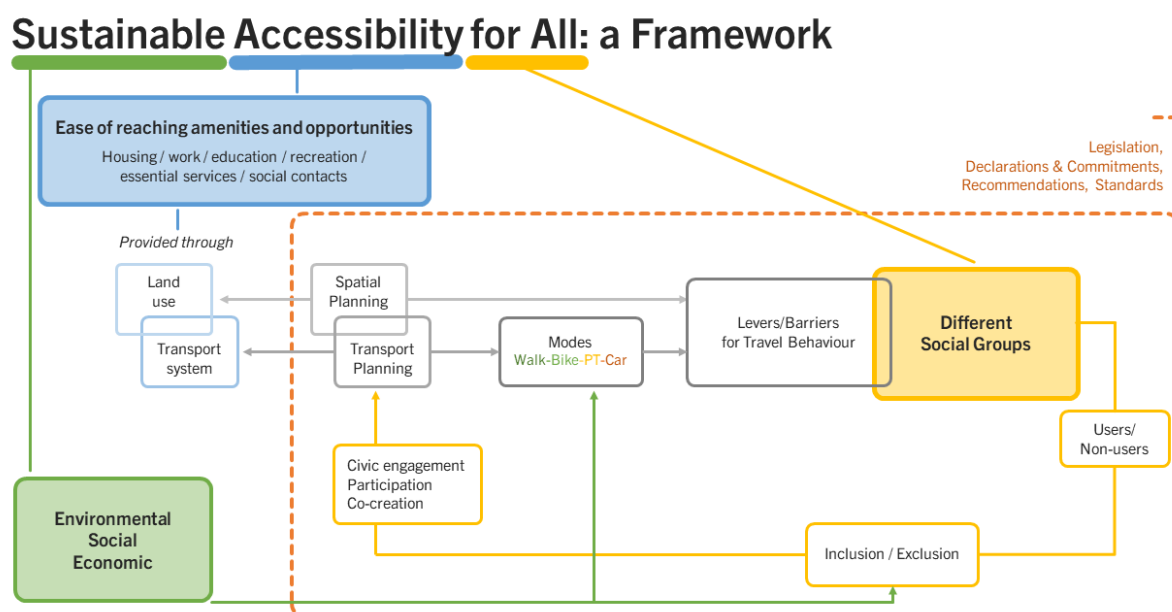
Source: Vitrano and Mailer (2023).

The framework considers the roles of land use and planning, the transport system and mobility in defining accessibility. In doing so, it addresses 1) the risks of inaccessibility and social exclusion and 2) the need to change travel behaviour towards sustainable modes.

The framework helps highlight different users' and stakeholders' perspectives. This makes addressing issues of involvement, recognition, and participation easier, especially for under-represented and hard-to-reach groups. Furthermore, the framework highlights the need to consider changes in travelling behaviour as a change in mindset for users, policy makers, and transport operators. Both need to consider the diversity of resources and barriers affecting (sustainable) accessibility for different people.

The framework demonstrates how the levers and barriers for sustainable travel behaviour resulting from land use and the transport system interact with and affect different social groups in different ways, thereby contributing to the definitions of users and non-users of transport (and amenities). This can result in different potentials for access to (un)sustainable transport modes and exposure to transport, mobility, or access poverty risks, which can lead to social exclusion. It also emphasises civic engagement (i.e. participation) as a crucial method for recognising barriers experienced by different groups and improving spatial and transport planning.

This report explores the factors influencing accessibility that policy makers must consider in their planning. It also covers the different levels of government and their remits to help identify when and what level of consultation is likely to be most effective in overcoming barriers to accessibility. Finally, the report looks beyond mobility policy. It considers land-use and spatial planning, the growing digitalisation of economies, and their roles in securing accessibility for all.

Access to education, healthcare, employment and social opportunities are critical for well-being and equity. In recent years, policy makers in several countries have sought ways to improve transport policy to

better reflect equity and participation across social groups and regions, and to focus more on the quality of travel activity taking place (ITF, 2020; ITF, 2021; Government of Ireland, 2023).

Even within different population cohorts, no social group is homogeneous (Haustein et al., 2013). A range of factors influence individual mobility. The next two chapters discuss factors that affect accessibility and the sustainability of travel choices, including person-based (i.e. socio-demographic, economic and socio-cultural) factors, territorial factors (ITF, 2021) and available modal options. A separate chapter outlines tools for incorporating these various factors into planning.

The report then moves on to discuss the challenge of incorporating accessibility in governance, before concluding with an overview of an emerging approach to transport planning that incorporates land-use systems and digital connectivity while accounting for future uncertainty about mobility preferences.

Policy insights

- Recognise the different elements involved in achieving sustainable accessibility. Focus on access to opportunities, not just mobility: Transportation policy should aim to ensure people can easily reach essential services, jobs, and amenities, not just move faster or further.

- Balance accessibility with sustainability: Encourage the use of sustainable modes of transport (walking, cycling, public transport) while ensuring everyone has access to these options. Accessibility needs vary across different social groups. Involve citizens, user groups, and other stakeholders in transport planning to ensure policies reflect community needs.

- Coordinated planning of land use and transport systems can improve accessibility by bringing amenities and opportunities closer to where people live. Accessibility also includes digital access, which is crucial for participation in the modern economy.

2. Person-based metrics are crucial to accessibility

Much research has been conducted into mobility and accessibility challenges faced by individual groups in society. This work is critical to understanding the ways conventional transport planning has failed to fairly provide access to opportunities across society. However, individuals may be members of multiple societal groups at any one time. Those groups can also differ internally according to socio-economic characteristics, life stages and responsibilities, disability diversity, competencies (e.g. digital literacy), time-use patterns (e.g. working in non-standard working times) and trip purposes (e.g. work, education, recreation or care responsibilities), safety perception, cultures, attitudes and preferences, belonging to different urban populations (e.g. residents, commuters, and city-users); and their unique combination of all of the above. The lack of recognition of this diversity can result in exclusion from planning processes or different potentials for access to (un)sustainable transport modes and opportunities.

Modern societies are marked by an increasing diversity of living conditions, ethnic backgrounds, Indigenous statuses, interests, role models, attitudes and values. Increasing diversification within traditionally defined socio-demographic and socio-economic groups results in a wider range of attitudes and behaviour with regards to mobility. Categories such as age, gender, nationality, household type, educational level and income have lost their "explanatory power" for some outcomes, including preferences for certain transport modes, prioritisation of environmental protection, or propensity to use new technologies.

This chapter explores some of the more prevalent facets explored in relation to different social groups to illustrate barriers that commonly affect their accessibility in the context of traditional transport engineering approaches to planning. At the same, however, an individual will be a member of multiple groups. The concept of intersectionality – that is, the interaction of experiences based on gender, race, income and other types of discrimination – appears to be less well explored in the context of transport policy (Ravensbergen, Buliung and Laliberté, 2019). Still, it gets closer to the realities of transport barriers explored in this chapter. Namely, that accessibility is not a one-dimensional concept.

Socio-demographic and economic factors

Previous work has identified socio-demographic and economic groups whose needs are not always necessarily well understood by transport planners: low-income earners and those who are unemployed; persons with reduced mobility and disabilities; older adults; children and youth; Indigenous and traditional rural communities or populations living in rural and deprived areas (covered under territorial factors); migrants and ethnic minorities; women and girls; and anyone who cannot or does not drive (ITF, 2021; Dotter, 2016; ECMT, 2006; ITF, 2019a).

Gender

There is a significant body of research on gender-based differences in transport needs. Among the key considerations are perception of safety, complex travel patterns, different work patterns (e.g. more part-

time work), travelling encumbered (i.e. with children or older people when acting in a carer role), trip chaining (which can increase cost) and being negatively impacted by service inefficiencies when relying on multimodal trips (Duchéne, 2011; Ng and Acker, 2018; ITF, 2018; 2019, 2021). A lack of gender-disaggregated data at a wide scale contributes to blind spots in transport planning (ITF, 2019).

However, gender is not the sole determinant at play. A systematic literature review of the intersections at play in women's uptake of active mobility found that, in addition to marked differences between men and women, differences in perception and uptake also existed based on socio-economic status, race and ethnicity as well as profession and educational attainment (Yuan et al. 2023). The built environment and women's perceptions of neighbourhood safety were found to be important, too.

Built environment and perception of safety and fear of sexual harassment or assault also affect women's use of public transport (ITF, 2018; 2019; Sil et al., 2023; Gardner et al. 2017), although the understanding of the impacts is not consistent in all countries (Gardner et al. 2017). Prevailing patriarchal society structures, socio-economic factors and educational attainment are also limiting factors in some countries (Sil et al., 2023). Connectivity issues can also be a major barrier, especially in rural or poorly served areas.

The travel patterns of those in part-time work and care-giving roles differ from the conventional commuter patterns on which many transport systems are built. In many societies, carer roles are still predominantly carried out by women. However, restrictions on travel associated with travelling while escorting a dependent or travelling at off-peak times can apply to anyone carrying out these roles. Women are also more likely to combine purposes and destinations in one journey (trip-chaining), which can result in increased ticketing costs and time inefficiencies when using public transport (ITF, 2019).

Access to a private car can actually be an opportunity for freedom for women, or essential to access opportunities; but in many regions, women have lower access than men (Duchéne, 2011; OECD, 2024). In a recent study in Ireland, for example, the majority of women in both urban and non-urban settings reported that the car is a necessity in their lives (TII, 2020). Again, gender is not the only factor at play. In the United Kingdom, for example, the lowest-income households without car access also have the highest representation of "female heads of house, children, young and older people, black and minority ethnic (BME) and disabled people" (Lucas et al., 2019). This is an important indicator of why sustainable mobility policies need to be well designed to avoid perpetuating disadvantage. Such policies need to focus on access to opportunities, in tandem with policies aiming to overcome barriers to using sustainable modes.

Age

The world's population is growing older (UN DESA, 2022). This will have implications for their mobility needs. Local area design will have an impact. Greater neighbourhood opportunities (including access to services) can support in-community ageing, reducing older people's need to travel. This can also have knock-on impacts in terms of social participation and reduced risk of loneliness (OECD, 2001; 2021; Frye, 2011). The option to drive and the availability of affordable and accessible public transport are important for older adults' mobility and access to society (Pellichero et al., 2021; Dabelko-Schoeny, 2021). However, the presence of public transport or sustainable mobility options does not guarantee their use by older adults (Durand and Zijstra, 2023; Corran et al., 2018).

The built environment also has an impact on the attractiveness of walking and cycling (Dabelko-Schoeny; 2021; Močnik et al., 2022; Panahi et al., 2022). However, the findings for older adults vary. For example, a study in Hong Kong found that older adults were not necessarily less mobile than their younger counterparts, although trip purposes differ (He et al., 2017). Travel pattern differences were found to be

related to employment status, car ownership, their income and household characteristics. This points further to the intersectionality of access needs across and within social groups.

Although many studies of age and mobility or age and environment exist, chronological age is an increasingly poor substitute as an indicator of frailty, physical and mental disabilities and constraints, as chronical age groups vary internally. Moreover, international comparisons must be analysed carefully, as physical and transport conditions vary as much as polices and planning, and older people's societal roles.

There is no single definition of the needs of an older person. The World Health Organization (WHO), for example, considers healthy ageing in the context of the ability to maintain or develop functional abilities that support well-being rather than in the context of assumed needs for specific age bands (Meißner and McNair, 2021; WHO, n.d.). Functional ability, in this context, "is made up of the intrinsic capacity [physical and mental] of the individual, relevant environmental characteristics and the interactions between the individual and those characteristics" (WHO, 2023).

However, by the time people reach old age it is too late to begin policy interventions. "Ensuring economic security and health for all in old age calls for promoting equal opportunity from birth, including through universal access to health care and education as well as opportunities for decent work" (UN DESA, 2023). In other words, accessibility for older people means accessibility for the whole community.

As with other societal groups, young people's mobility is context-specific (ITF, 2024a). It has been suggested that youth mobility is overlooked because young people are not considered economically "productive" (Joelsson et al., 2022). While significant differences exist between different countries, young people travel for similar reasons and by similar means. For young people, a typical daily journey or schedule may differ from other transport users. Similar to gendered trip patterns, they may trip chain (multiple destinations per journey) and use multiple modes.

Youth mobility therefore requires specific analysis and understanding. Young people's travel choices are dynamic, driven by an intricate web of factors that extend beyond mere individual preferences. Interactions between the different factors include, but are not limited to, living arrangements, financial constraints, residential location, the proliferation of information and communication technologies (ICTs), influence of transport policies, and safety and security concerns (ITF, 2024a).

There are significant differences between mode choices in the Global South and Global North. Youth in low- and middle-income countries travel mainly on foot and bicycles or rely on informal transportation, and they aspire to own modes of personal motorised transport, especially two-wheelers (ITF, 2024a). The lack of adequate public transportation and active mobility infrastructure, as well as safety and security concerns, and financial constraints, shape youth mobility in this context. Due to limited youth-specific data, it is unclear if young people in developing countries make fewer or more trips compared to previous generations and if trip distances and commute times are increasing or decreasing. Meanwhile, young people in advanced economies still primarily rely on car travel for their daily activities, although they drive less than older cohorts (ITF, 2024a).

Young people under the legal driving age depend on being driven by their adult family members. A recent survey in Japan shows that the about 60% of 16- and 17-year-old youth surveyed in a rural area, and about 30% in a low-density urban area, feel that they cannot often realise basic out-of-school activities such as meeting friends, shopping where they want, and visiting facilities and amenities they want to visit without being driven by family members by cars. Approximately 40% of those surveyed in the rural area must forego such activities as there are no or limited public transport alternatives (Yoshizawa et. al., 2023). As with other factors, aggregate and disaggregate data with a large representative sample size is necessary

to truly understand youth mobility, trends, and patterns, reveal specificities, and address context-specific challenges and opportunities.

Migration

Delbosc and Shafi (2023), reviewing recent studies (mostly from Australia and the United States) of immigrant travel behaviour, find few common threads to these cohorts' travel patterns, although new immigrants tend to rely less on the private car. Individual cohorts make more use of public transport or active modes than others. Some are more reliant on carpooling or car-sharing, with their origin country being important to this outcome. However, the reasons underpinning this behaviour vary greatly.

Socio-economic factors, settlement patterns (e.g. living in communities of other immigrants), origin and destination countries, and socio-cultural and gender factors all influence immigrant travel patterns. Delbosc and Shafi conclude that more, and broader, data is needed to better understand immigrant populations and the "great diversity of intersecting influences on [their] travel behaviour" (2023: 927). Similar results have been found for refugee migrants, with evidence that gender, age, income levels and cultural norms also interact to impact travel behaviour and attitudes (Smith et al., 2022; Ozkazanc, 2021; Vais et al., 2020; Bose, 2013). Delbosc and Shafi (2023) also find that the longer immigrants are in their destination country, the more their settlement and travel behaviours begin to reflect native-born populations.

Indigenous communities

While literature on ethnically mediated transport disadvantage is growing internationally, Indigenous groups' accessibility challenges remain relatively unstudied and unaddressed in many places (Raerino et al., 2012). Australia and New Zealand, in particular, have started to focus more on identifying Indigenous transport issues in recent years.

In Australia, mobility options for Aboriginal and Torres Strait Islander people living in remote communities or communities at the fringes of urban areas are often very limited, with little access to public transport. Around one-third of people living in these communities have no access to a motor vehicle (Currie et al., 2007; ABS, 2010). Indeed, a study conducted in 2014-15 indicated Indigenous Australians aged over 15 years were 9.1 times as likely as non-Indigenous Australians (8.2% versus 0.9%) to report either being unable to get to places they needed to, or never going out, or being housebound (Australian Institute of Health and Welfare, n.d.). Such mobility challenges can exacerbate other areas of disadvantage suffered by Indigenous communities, particularly accessibility to employment, health and education as well as cultural events and obligations (Currie, 2007; Helps et al., 2010; Ivers et al., 2016).

Māori, the Indigenous people of New Zealand, face similar difficulties. The processes of colonisation – particularly loss of land, urbanisation and gentrification – have contributed to Māori homes often being located further than non-Māori from economic, social, and cultural opportunities (Raerino et al., 2012; Waka Kotahi NZ Transport Agency, 2022). Income and educational inequalities, inadequate public transport, and the strong link between private vehicle ownership and access to employment foster vicious cycles of disadvantage. Incentives to drive illegally (either without a valid driver's licence or a roadworthy vehicle) increase, leading to a disproportionally higher risk of criminal charges (Raerino et al., 2012). These factors also contribute to Māori being significantly more likely than non-Māori to be injured or killed in traffic collisions (Waka Kotahi NZ Transport Agency, 2022).

If transport policy is to contribute to addressing wider existing inequalities, it needs to consider Indigenous peoples' well-being needs. A strategy designed to include greater participation of Indigenous peoples in

decision-making processes, coupled with targeted interventions to counteract factors which inhibit accessibility, is required for substantial and sustained improvements.

Income and employment

Lucas (2012) reviewed literature from around the world on transport and social exclusion. She observed that people in the lowest-income cohorts and the most socially disadvantaged groups also experienced poor access to transport. A systemic review (Simcock et al., 2021) found that more than three-quarters of energy and transport poverty studies identified persons on low incomes (the most frequently occurring group across the literature) as at-risk.

People on low incomes often find themselves trapped in their situations by poor accessibility, with available transport options shaping their opportunities (ITF, 2022). Previous work by the ITF supports this assertion, finding:

> . . . significant evidence across countries that lower-income populations tend to suffer more from restricted transport options, have lower quality transport services available to them and travel under worse conditions (safety, security, reliability, comfort). Broad evidence also suggests that the lack of, or poor access to, transport options is central to limitations on access to jobs, educational institutions, health facilities, social networks, etc., which in turn generates a "poverty trap" (ITF, 2017a: 11).

However, this restriction relates not only to the availability of transport options but also to the availability of affordable transport options. For example, high transport costs can dissuade people from remaining engaged with their education (UNESCO, 2008).

While there is no single working definition of transport poverty, Lucas et al. (2016) and Mattioli (2021a) analytically distinguish four aspects of transport poverty: 1) mobility poverty, 2) transport affordability, 3) accessibility poverty and 4) exposure to transport externalities. While the first three aspects are considered in most poverty studies, the fourth is often neglected. Exposure to transport externalities describes a "paradox": social groups that are less mobile, and produce the fewest emissions, suffer most from the output of better-off cohorts due to where they live (as a basic logic of the housing market but also the allocation principles of public housing and urban planning).

Lucas (2019) conducted a state-of-play review of transport-related social exclusion research, including papers from the Global North and the Global South. She found that, by and large, research globally has noted similar trends. Low-income households travel less than their higher-income counterparts. However, transport challenges vary between economies. The author recommends emerging economies adopt accessibility in their strategic planning. The *ITF Transport Outlook 2023* (ITF, 2023a) also recommends incorporating strategic planning from a sustainability point of view, especially in urban areas that are projected to grow, to avoid engendering car dependence as populations and economies increase.

Several studies have highlighted that the ability to own a car does not mean that a low-income household is not suffering from transport poverty. Car ownership and use can put a low-income household under financial strain (Mattioli, 2021). Those living at a great distance from the places they need to go to in order to fulfil their essential needs can also suffer time poverty, regardless of their mode or income. These demand patterns are exacerbated in areas where car-dominant planning has facilitated a spreading-out of the settlement footprint (Lucas, 2012). Time poverty due to transport options and distances can also be an issue in countries in the Global South (Mattioli, 2021).

Mobility constraint and disability

A significant share of historical research on transport accessibility appears to be focused on persons with disabilities. In 1978, the European Conference of Ministers for Transport (ECMT) issued its first resolution on the topic of accessibility in transport, focussing on improving access for persons with disabilities (ECMT, 1978). Between 1978 and 2001, the ECMT issued a further 10 resolutions on the topic of accessibility in transport. The resolutions primarily focussed on improving the inclusion of persons with physical disabilities in transport provision, with some consideration of those with cognitive impairments or experiencing mental health issues.

Yet despite this prevalence and endurance in policy research, the World Health Organization (WHO) highlights the "health inequities" still endured by persons with disabilities, who face "unfair conditions . . . including stigma, discrimination, poverty, exclusion from education and employment, and barriers faced in the health system itself" (WHO, n.d.). Navigating the transport system can be "15 times more difficult" for persons with disabilities than for those without, due in large part to issues with access and affordability (WHO, n.d.).

A Swedish study on persons with neuropsychiatric disabilities found that such disabilities limits accessibility by public transport, as they avoid travel due to consequences such as fatigue, anxiety, stress and sensory overstimulation. Public transport service and organisation are not adapted for people with social difficulties, sensory hypersensitivity and difficulties with planning and organization (Berg and Ihlström, 2020). Mobility constraints and disability do not belong to minority groups in society: a survey in Madrid showed that 51% of public transport users felt that they had at least one permanent or temporary mobility restriction or disability (Lemmerer et. al., 2018).

ITF work published in 2004 identified recommendations on how to operationalise accessibility improvements, particularly for improving access to public transport for persons with disabilities. Drawing on case studies from four European cities, it emphasises "the role of national governments in improving accessibility of local public transport", the need for "co-operation between local authorities and public transport operators", as well as co-operation with persons with disabilities in defining and implementing accessibility. In addition, it is important to ensure full accessibility through technical issues, specialised services, transport infrastructure, information, driver training, costs and benefits and future planning (ECMT and UITP, 2004).

These principles remain true two decades later and can be broadened to apply to sustainable accessibility for all social groups – not solely in relation to physical access for those with disabilities.

Socio-cultural factors

Using multi-dimensional as opposed to single typologies can help unpack the role that socio-cultural factors play in mobility decisions (Sonnberger and Graf, 2021). In particular, examining the interaction of "resources", "habitus" and "social milieus" aids an understanding of individual behaviour.

In socio-cultural analysis, "resources" denotes the amount of economic (income and wealth), cultural (graduation, ownership of cultural goods, cultural expertise), social (social networks) and symbolic capital (image, reputation) an individual possesses, as well as the ability to transfer one type of capital into another (Bourdieu, 1977). Examples include an individual's ability to buy a car (economic capital), use car sharing among friends (social capital) or know how to use a mobility app (cultural capital).

"Habitus" refers to a combination of central values, attitudes and tastes. The term describes what makes people tick and is an important mediator between resources and constraints set by structures and habits. Habitus explains how individuals self-regulate their behaviour to fit the expectations of their social environment.

People's "social milieus", or social environments, also have some indirect impact on mobility preferences (e.g. propensity to use private vehicles, public transport or micromobility), as well as on decisions regarding where to live and work, which cumulatively affect settlement structures (Markvica et al. 2020; Millonig 2021). Social milieus constitute sound societal target groups to consider when designing policies focused on changing mobility behaviour as they are based on attitudes, which are strong drivers for behaviour patterns. Strategies to support mobility transition beyond technological innovation should be based on better knowledge of a given social group's ideas and aims (Dangschat and Millonig, 2023).

Although extreme structural dichotomies (e.g. poverty versus richness, or remoteness versus inner-city location) still determine mobility behaviour, socio-cultural aspects can explain the choices and behaviour of structurally similar persons, particularly in the context of a wider range of opportunities. Therefore, if the aim is to change mobility behaviour, then material access, participative ability and individual ambition are relevant (see Figure 2).

Figure 2. Elements relevant to behaviour change
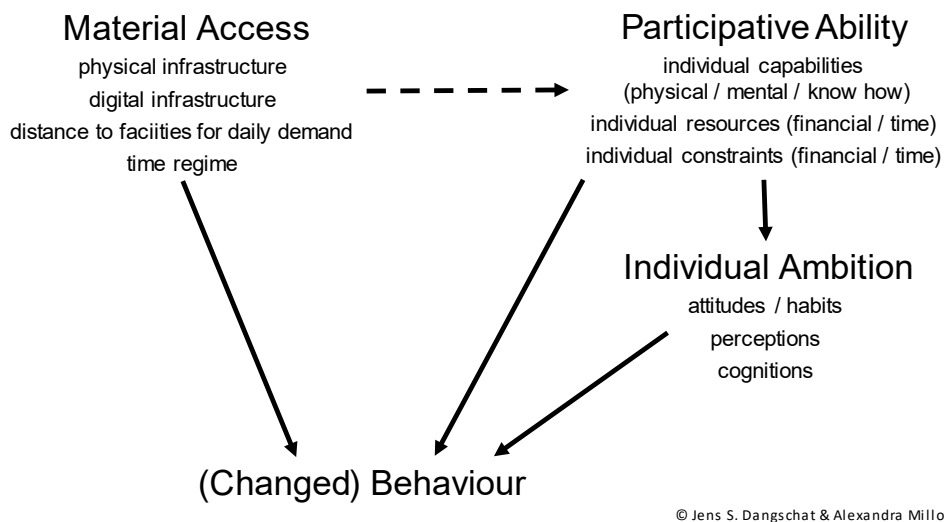
Source: Jens Dangschat,

While considering social-cultural factors could help policy makers better design and target interventions aimed at incentivising uptake of more sustainable transport modes, relevant indicators are absent in official statistics. This has two negative outcomes. First, political and planning decisions are made under blind conditions regarding societal diversity. Second, social science research on the determinants of sustainable accessibility is hampered.

In automobile-oriented environments, people develop their needs around the use of their cars. In the real-world policy-making environment, merely pursuing behavioural change would lead to a potential loss of widespread support and confidence from the voting public or taxpayers. While there is no single or correct

way to address this risk, measures implemented in the right order, and packages with indirect measures addressing people's needs, would provide important avenues for change.

Policy takeaways

- While standards exist for physical access, the level of interactions between socio-demographic and socio-economic, socio-cultural, territorial, and modal mix aspects that impact accessibility means that it is not likely to be universally generalisable.

- Accessibility will more likely need to be dealt with progressively at different stages of governance and planning processes. One-dimensional frames for considering accessibility needs are also too narrow. Using a multi-dimensional approach, considering factors including age, gender, disability, social background, and cultural preferences, will better inform design for truly accessible transport systems and sustainable travel behaviour.

3. The role of territorial and modal factors in accessibility is critical to planning solutions

The area where a person lives or stays is central to the availability of amenities, opportunities and accessible transport options. Broadly speaking, transport options are assumed to be most heavily influenced by the physical and functional density of an area. For example, fixed-route conventional public transport options can do very well in densely populated urban areas. However, they can be less attractive in low-density rural regions.

Figure 3 illustrates the three main types of settlement. However, differing settlement forms, related to population size and proximity to other settlements, exist within each of these types. Reasons for living in different settlement types also vary, with the availability of a car influencing where people choose to live and travel (Dangschat, 2018; Scheiner, 2010). Urban settlements include city cores and surrounding areas from where people commute (often referred to as a functional urban area). Towns and semi-dense areas are less dense than urban settlements, while rural settlements are the least dense (OECD, 2020).

Figure 3. The three main types of human settlement
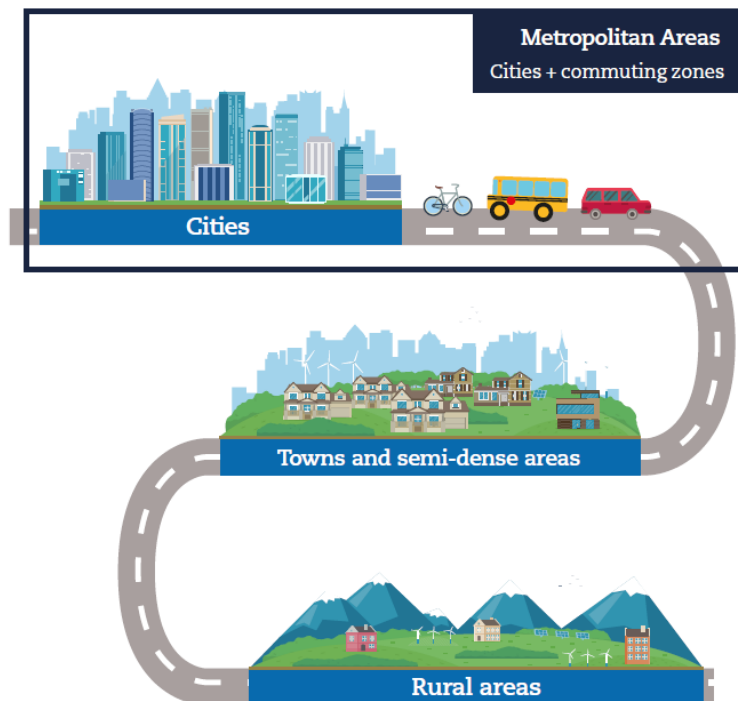
Source: OECD (2020).

Each settlement type will have different viable modes. In many cases, different agencies and authorities will be responsible for planning, service operations and infrastructure management. Generally speaking, the more central a place is, the more alternative modes people have. For this reason, mobility behaviour in central areas is more inter-modal. Policy makers and planners have a greater range of policy tools and measures available to improve the sustainability of travel within urban settlements.

By contrast, regional, intercity and international trips are typically longer on average. Here, it is important to improve the availability of modern, safe, reliable and affordable sustainable alternatives to the private car to support widening accessibility for deprived social groups without having to rely on their own car. In the case of regional transport and rural regions, potentially sparser availability of essential services (e.g. healthcare and schooling) and amenities, along with the potentially wider dispersal of origin destination pairs, can also influence the most suitable modes.

For walkability and bikeability, the quality of public space (including foot and bicycle paths, parks, squares and water courses) are important for encouraging active mobility, which is the cheapest and healthiest way to be physically mobile. Therefore, it is important to focus not only the physical proximity to amenities, services and meeting points but also the attractiveness and comfort of the built environment. Besides objective standards of functionality, safety and security, cognitive awareness of the variety of experiences, design and presence of other social groups are relevant. However, all these aspects are discerned individually or highly selectively among different social groups (Löw, 2016).

The re-organisation of public space is sometimes described as "tactical urbanism" (see e.g. Pfeifer, 2013; Stevens and Dovey, 2022) in the form of bottom-up initiatives instigated by community groups and as top-down initiatives instigated by town planners. Barcelona, Paris and Vienna are forerunners of tactical urbanism in Europe. The concept of the 15-minute city also emphasises the reorganisation of public space and urban mobility (Allam et al., 2022; Pozoukidou and Angelidou 2022; Driving Urban Transitions Partnership, n.d).

A recent Austrian research project, Trans|formator:in, looked at the transformation of public space. It focused on the re-organisation of physical spaces in seven Austrian communities; participation and learning processes among urban stakeholders and citizens; and lessons for other cities looking to focus on active mobility.

Territorial factors

Accessibility in urban areas

Urban settings are generally assumed to have better accessibility due to their greater population density, making public transport solutions viable, and the greater density (and proximity) of points of interest. However, while this can be true for denser city cores, the outer area of cities, particularly commuting zones, can still suffer from poor accessibility by public transport and active modes. Even access by private motorised vehicle can be lower in commuting zones due to longer trip distances (ITF, 2019b).

However, cities are not homogenous. A city's size and form also affect its accessibility. A study in Sweden found that only large cities provided comprehensive accessibility by public transport alone (Larsson et al., 2022). Lower-density suburbs and small towns see higher car dependency. Data from India (Soman, Kaur and Ganesan, 2019) also suggest that private motorised vehicles (cars and motorbikes) are more popular in smaller cities (with populations between 100 000 and 2 million) than in the largest cities (with populations above 7 million).

Likewise, while walking can be more viable in settings with a greater density of opportunities, metropolitan areas with a large footprint can undermine walkability. Tao, Fu and Comber (2019), in a study of the Yorkshire region in the United Kingdom, found that although urban commuters were more likely to walk, cycle or take the bus, private motorised vehicles still held the largest mode share in both urban and rural contexts. This highlights that accessibility by sustainable modes is not universally true for all urban settlements.

Cities that are more spread-out can impact the access to the public transport network and the level of "access to high-frequency public transport varies strongly across cities" (OCED/European Commission, 2020). Cities with a higher share of commuters living in suburbs can also face greater costs when expanding public transport networks to meet their needs.

In many developed countries, the prevailing moto-normative approach to urban design has also baked in car-dependency. This reliance on cars then becomes a self-fulfilling prophecy, as more people own cars, settlements develop around the assumption that essential services will be accessed by car, fewer collective modes are planned (or are viable) and car ownership becomes essential (Litman, 1995; see also Figure 4). In the United States, for example, a car is generally required to access goods and services. This is particularly the case for older people, families with children, persons with disabilities and low-income households (ITDP, 2019).

Figure 4. The cycle of automobile dependency and sprawl
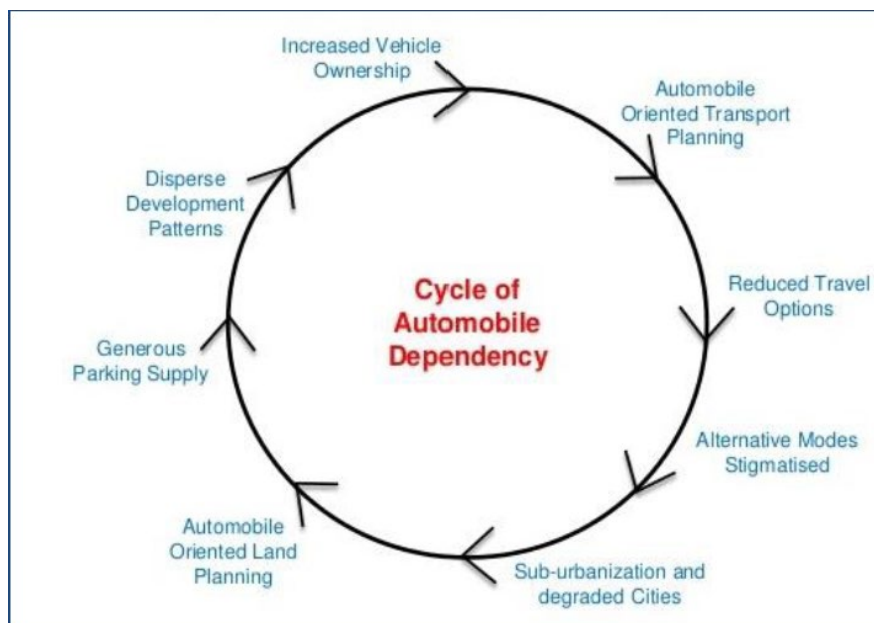
Source: Litman (1995).

The five Ds of urban planning – density, design, diversity (of land use), distance (to transport options) and (accessibility of) destinations – are important for demand management and mode choice in terms of sustainable travel. However, the role of population density is sometimes over-estimated, with design and diversity also being associated with vehicle-kilometres travelled, and the choice to use public transport or walk (Ewing and Cervero, 2010; 2017).

In the case of walking, job availability relative to housing is more important than general land-use mix. Proximity to public transport stops is strongly associated with public transport use, and transit-oriented

development coupled with infrastructure investment that improves access to, and by, public transport can also contribute to achieving sustainable travel goals (Lund et al., 2006; ITF, 2023c). As Ewing and Cervero note: "Almost any development in a central location is likely to generate less automobile travel than the best designed, compact, mixed-use development in a remote location" (2010: 276). This is important when considering the potential future role of the car in accessibility beyond urban centres.

Integrated land-use and transport planning can help provide access to opportunities for people on low-incomes. It is important to incorporate "transport-related indicators (travel times and costs), particularly for reaching jobs, into housing quality definitions used in the design and evaluation of social and affordable housing programmes" (ITF, 2017a; 2022). This is also consistent with the finding of a future mobility review conducted by the UK Government, which found that the planning of urban settlements and mobility should be integrated "with particular attention to the provision of low-cost accommodation in areas with high levels of walking and public transport access to employment and other key activities" (DfT, 2021).

A study of Santiago de Chile found that residents in the wealthiest neighbourhoods benefited from greater public investment by a factor of 2.5 and had shorter car-trip distances (-13.4% on average). The results suggest these residents have better access to amenities and employment opportunities than those living in lowest-cost housing (Tiznado-Aitken et al., 2022). Transport costs can also be a heavy burden for young adults with limited financial resources, particularly unemployed youths. As Henriksson et al. concluded: "If social inclusion is to be regarded as important, to be able to live and work locally should be an important goal for policy" (2021: 804).

Accessibility in rural and remote regions

People living in rural settings often have fewer opportunities accessible by sustainable modes. But they can often access these opportunities by car, and this can also be true for peri-urban residents. This puts them at higher risk of car dependency (Carroll, Benevenuto and Caulfield, 2021; Mattioli, 2021b). In terms of lowering carbon emissions, these areas could also benefit from greater uptake of zero-emission vehicles, such as electric vehicles. However, if these are still private motorised vehicles, issues of accessibility associated with lack of access, affordability or ability to drive will remain unaddressed.

Rural settings that have lower densities, less infrastructure and more dispersed demand patterns present a challenge to conventional public transport (UITP, 2022). An assessment in Sweden, for example, showed that the car provided the greatest access to opportunities compared to public transport and walking. In this study, cycling even "provided access to a wider range of activity categories than public transport" (Larsson et al., 2022). This underscores the potential role for better cycling provision in rural settings.

Modelling projections for the *ITF Transport Outlook 2023* also showed that, at the global scale, passenger cars are expected to remain the largest mode for this type of rural travel through to 2050, even with more ambitious transport decarbonisation policies in place. However, the share of cars will naturally vary by country. By contrast, according to the Outlook, when a higher decarbonisation ambition is adopted, more sustainable alternatives grow their mode share for both urban and intercity activity (ITF, 2023a).

This discrepancy between rural and urban and intercity activity speaks to the challenge of moving rural travel away from reliance on private cars while maintaining access levels. While new solutions may become available as technologies develop, the Outlook results suggest that rural mobility in many countries will likely still need more flexible, lower-occupancy options rather than relying solely on conventional fixed route buses, for example, where motorised modes are being considered. Some existing alternatives are discussed in Chapter 4 of this report.

In terms of infrastructure and service provision, rural settings can suffer deficiencies in both transport and digital connectivity. OECD work on access and service delivery has found that rural residents in Europe must travel an additional five kilometres, on average, to access education compared to their urban counterparts. Rural residents also face longer access times for healthcare facilities, which is true for both OECD and G20 countries. This, in turn, can contribute to poorer health and education outcomes for rural residents (OECD, 2022).

Within the classification of rural settlements, the OECD categorises rural areas into three distinct types (OECD, 2020):

1. Rural within functional urban areas (FUAs) – rural areas in close proximity to urban centres

2. Rural outside FUAs – outside of the functional urban area, but with an FUA close-by

3. Rural remote – rural areas far from any functional urban area.

The OECD framework highlights the fact that rural communities are responsible for the majority of resources needed for modern life. However, within OECD countries, only 30% of the population is rural and often, there is a sense of the benefits of economic growth being far removed from rural communities (OECD, 2020). Rural areas face a unique set of challenges and opportunities, depending on their proximity to urban settlements. Rural remote regions, in particular, can face extreme economic cycles if their local economy is reliant on a single industry, such as tourism (OECD, 2020). This will affect the range of viable transport solutions available for residents to access essential services.

Coastal and archipelagic areas constitute a special type of rural area, which has a fluctuation in population, but is often overlooked in research and policy plans. Statistically, the population is low, although in certain periods of the year there is a large influx of second-home residents and tourists. This dynamic can be seen in Denmark, Finland, Norway and Sweden, for example, and in Croatia on the Adriatic coast and Dalmatian archipelago, whose geography is characterised by lakes and long coastlines. The infrastructure (roads, broadband, electricity and water supply) in these areas needs to be better adapted to the enormous load that occurs during parts of the year. Better access to sustainable transport options on road and on water must be ensured to avoid an even greater burden from car traffic as these areas become populated.

In established regions, the solutions may need to look different. Wiersma, Bertolini and Straatemeier (2017), for example, considered the development of economic centres and road investments in the South Limburg region of the Netherlands, which is facing population decline. Based on an investigation of different policy scenarios, they concluded that trying to improve land use along routes with existing public transport was less effective than improving the transport links to "existing economic centers".

Viable modes differ by territorial setting

Dulmen et al. (2022) concluded that the car-based activity "of disadvantaged people" was more influenced by their socio-economic status than, for example, the region where they lived. In the United Kingdom, deprivation tends to be higher among urban residents than rural ones (UK Government, 2019). In the European Union, in contrast, on average the rate of individuals "at-risk-of-poverty or social exclusion" was highest in rural areas. However, among some of the more affluent countries in the EU, the rate was highest in urban settings (European Commission, 2022).

Poverty and unemployment rates in Europe have tended to be higher in the biggest cities than the national average, due to labour markets and international migration. In the bigger cities, poor people rarely own cars as they can use cheaper transport modes. In more car-dependent areas, poor households are trapped

as they have no alternatives, and suffer disproportionately from increases in energy prices (Mattioli et al. 2019).

Providing public transport services does not, in and of itself, enhance accessibility. By contrast, improving access to jobs by public transport "improves individual employment probabilities, in particular in metropolitan areas and smaller cities and towns with lower car ownership rates and in low-income neighbourhoods". Young people and those with lower levels of education attainment benefit most from such interventions (Bastiaanssen, Johnson and Lucas, 2022).

Lucas et al. (2018) concluded that "both social and environmental factors are almost certainly at play in determining the travel behaviour outcomes of low-income households, and these are highly specific to the micro-scale neighbourhoods in which people live". This suggests that not all aspects of accessibility policy can be dictated through a top-down structure, such as by national government. Bottom-up elements will be needed to develop interventions that address the specific needs of individual areas. Chapter 5 of this report looks more closely at the levels of government and their remits.

The network of transport modes available will necessarily differ by geographic scope, as not all modes are viable in all settings. The denser urban settings, as well as intercity routes, can be viable locations for conventional public transport modes (i.e. bus, light rail, metro and rail). Bus or coach travel can also be prevalent in regional travel, although in lower-density areas the wider distribution of origin destination pairs does not lend itself to fixed-route transport options. That being said, flexible transport solutions can also face challenges in rural settings (ITF, 2021) and there is no "one-size-fits-all" solution – rather, solutions tailored to the specific local context are likely to be needed (Bauchinger et al., 2021).

Regardless of the form the transport mode takes, affordability will also be a key component of its contribution to accessibility (ITF, 2017b). In many cases, the availability of good communications infrastructure or Internet coverage will be important, and rural settings are often at a disadvantage in that regard. Figure 5 considers some alternative or complementary shared modes that may form part of mobility solutions beyond trunk networks. It also considers the settings in which these solutions are likely to be most appropriate. It shows the different models of transport provision that could be suited to different levels of population density.

Figure 5. Suitability of shared mobility types by population density and settlement type
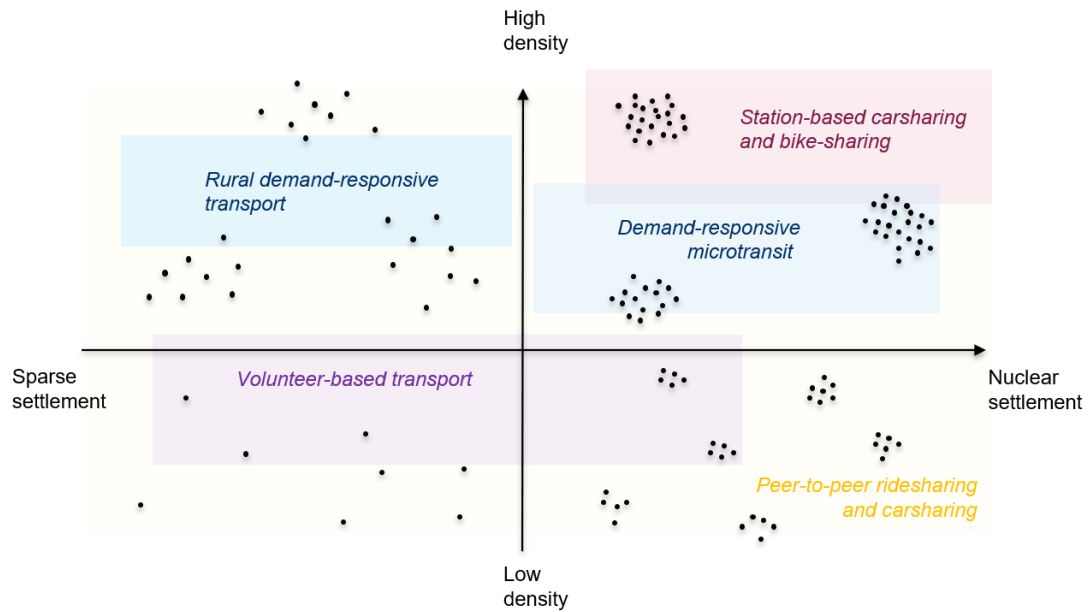
Source: ITF (2021).

Active mobility and micromobility

Promoting walking, cycling and other forms of light mobility involves putting a greater focus on the quality of the provision for these modes – not solely by increasing the numbers of people using these modes by pushing people out of motorised modes. Reducing moto-normativity in planning will reduce the dominance of cars and improve the attractiveness of the built environment. Security, in addition to road safety, needs to be a core part of transport policy (ITF, 2024b).

Walking, cycling and other forms of light mobility have the potential to act as standalone solutions and also as feeder modes to the trunk network. To date, the design of walking and cycling infrastructure has tended to focus on urban settings (Ayur et al in ITF, 2021); this needs to expand to better reflect peri-urban and rural settings. The United Nations and the Institute for Transportation and Development Policy have developed design guidance to support walkability, including the elements of the built environment that require investment to deliver attractive walking and cycling routes (UN Habitat and ITDP, 2018).

Micromobility modes such as e-scooters and e-bikes can play a role in expanding the access areas for trunk networks in urban areas (ITF, 2021e). However, as micromobility remains an emerging sector, the management of micromobility services, particularly in urban spaces, should remain under review to ensure policies are delivering against objectives. Many new shared micromobility fleets are also accessed via mobile applications, which bring their own accessibility considerations (see Chapter 6 in this report).

Public authorities have a role to play in ensuring active mobility objectives are included in national frameworks and funded accordingly. This is especially important in rural settings. The provision of dedicated infrastructure will also be important. Policy makers and planners should also consider e-bikes and other forms of micromobility; well-designed interchange points, such as mobility hubs that enable train and bike trips, have a role to play as well. Road space reallocation away from cars is also suggested as a way to improve provision for micromobility use, bikeability, walkability and the place function of public space in urban settings (ITF, 2021e).

Demand-responsive transport

Depending on its setting, demand-responsive transport (DRT) can act either as a first- or last-mile mode to supplement the trunk public transport network, or as a substitute mode to replace fixed-route services where they are not viable. Experiences of rural DRT documented by the ITF (2021) suggest that its success is not guaranteed, and that viable models need to be "based on careful consideration of the operational environment, funding arrangements and user needs".

This finding is also borne out by the results of trials of demand-responsive solutions in lower-density suburbs of London, which did not result in cost reductions for the public transport authority (London Assembly, 2022). However, where a role for DRT is identified, it is important to clarify whether it is expected to play a substitute or feeder role in the local modal mix (ITF, 2021). Public authorities can help ensure DRT services are co-ordinated with other public transport modes – but only if the authority is operating the services.

Ridesharing and ride-hailing services

Ridesharing and carpooling are examples of peer-to-peer shared mobility. These modes can provide mobility solutions in rural settings for those who do not drive and reduce the number of individuals driving to a particular location. However, where ridesharing is considered an appropriate solution, public authorities can support it by providing political and administrative support at the local level as well as dedicated infrastructure, such as parking, integrated with the public transport network, potentially through mobility hubs (ITF, 2021).

An ITF modelling exercise on ridesharing in urban areas and their commuting zones using taxis and taxi-bus-type services found that it would be possible to reduce the size of the private vehicle fleet required to achieve the same mobility and could result in environmental benefits, even before vehicle fleets transition to zero-emissions (ITF, 2016). Ridesharing has the advantage of increased flexibility without the users needing to be able to drive or have access to a private car.

Case studies of ride-hailing services in Hanover, Germany, and Barcelona, Spain, observed no "noteworthy" difference in participants' stated intention to use the services, based on "gender, age, users with or without driving license, or access to motorized vehicles" (Gilibert et al., 2020). This finding suggests ride-hailing services may not create barriers based on these factors. The top three criteria reported by participants as reasons for intending to use the service were availability, reliability and safety.

Community and commingled transport solutions

Community transport services operated by local providers to address identified local needs are typically not-for-profit and provided at low cost to users. As these are "bottom-up" solutions, public authorities can better facilitate their introduction by providing "easy-to-access information about how to start up and finance" them (ITF, 2021).

Community groups, such as Community Rail in the United Kingdom, can also support better access to existing modes. Community rail partnerships work with volunteers, operators and stations to improve access to rail and stations for people with disabilities and marginalised groups. The specific activities depend on the location and target audience, but they are tailored to reduce the barriers that some groups experience (Lowson, 2023).

Combining transport solutions for assisted mobility or public obligation transport (e.g. school transport) and wider on-demand solutions is known as the "commingled" or "integrated" transport (see Box 2 for an

example). The aim is to find efficiencies by offering multiple service types through a single fleet or operator, optimising the usage of the service. The continued development of multimodal transport platforms, such as Mobility as a Service (MaaS), has greatly advanced this concept (Schweiger, 2022).

Carsharing

Carsharing refers to schemes where the "ownership of the vehicles . . . is legally separated from the use" (ITF, 2021b: 29). These schemes are more financially viable in denser urban areas where they could reduce the size of the private car fleet (ITF, 2017; 2018; 2020). However, even in urban areas carsharing also risks substituting trips away from public transport. Carsharing schemes could contribute to a network of sustainable mobility options in peri-urban and rural settings. However, the business models are also less obvious in these settings and will likely need to be socially focussed (ITF, 2021b).

For some islands, as well as remote or archipelagic regions, connectivity and access are reliant on both air and maritime transport. These links are often too low in terms of usership to be commercially viable by sea or air. Smaller airports can struggle, while regional routes can have difficulty competing for airport slots at larger airports. In these cases, government action has included subsidising services and funding critical infrastructure (ITF, 2021c).

The private car still forms part of the modal mix, and outside of urban areas, is expected to continue to do so (ITF, 2023a). The role of the private car in sustainable accessibility can be a complex one. On the one hand, fossil-fuel cars are a significant contributor to CO_2 emissions due to passenger transport and come with other negative externalities such as congestion, crash risk and noise. On the other hand, as discussed in Chapter 2, for some segments of society and regions, the car represents the key to accessing their opportunities.

Box 2. Improving public transport accessibility for health service users in County Leitrim, Ireland

In Ireland, commingled (or "integrated") transport services were trialled between the local, on-demand solutions and the provision of local healthcare access services by the national health authority (HSE). In an integrated pilot project for the County of Leitrim, the National Transport Authority (NTA) and the Donegal Sligo Leitrim Transport Coordination Unit (TCU) worked closely with the HSE to plan and develop a revised network of TFI Local Link services for Leitrim. The services are designed to meet the needs of mainstream public transport users as well as passengers accessing (non-emergency) health care services. The first phase was implemented on 28 June 2021, with all services introduced shortly after.

Prior to the rollout of the pilot, the TCU procured and managed several "closed" transport routes on behalf of the HSE with a charge to passengers. These routes served a range of HSE day services including mental health, intellectual disability and older people services. The revised network and timetable amalgamate these closed routes into mainstream public transport, providing fully integrated and accessible services covered by the Free Travel Scheme. Similarly, many of the former door-to-door, demand-responsive transport (DRT) services secured by the TCU served single destinations and may not have been the most suitable or beneficial to other transport users.

The solution resulted in improvements for service users, including an expanded service schedule, improved availability of accessible vehicles; newer and larger fleets; improved connectivity and service provision; and improved accessibility and social participation. Efficiency of routing and vehicle

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occupancy also improved and stakeholder feedback has been largely positive. However, there were challenges in establishing the pilot, with significant time and work involved in planning and preparation to ensure the best network to facilitate passengers. Support had to be provided to health authority clients who were used to closed services and were transferred to open public transport. Some support was also required where passengers no longer had allocated seating or where passengers now had to travel a minimal distance to a pick-up/drop-off point but had previously travelled on a door-to-door service.

Co-ordination with the HSE also took significant time and work to provide transport for all passengers – the needs of each HSE user were considered on a case-by-case basis as part of the planning process. Some HSE users were allocated services similar to what they were used to, but some now travel on regular fixed-route bus services with a short walk to their nearest stop. Personal assistants and escorts continue to be allocated as required; HSE also allocated assistants on a temporary basis to familiarise users with new routes.

Since the introduction of the enhanced TFI Local Link network in Leitrim, passenger numbers have continued to increase. With a return to normal operations and travelling patterns and initiatives such as cheaper fares, the increase in passenger numbers on the revised regular services since July 2021 is significant.

Source: Government of Ireland (2024).

Digital platforms

Digitalisation plays an important role in the functioning of many of the solutions discussed in this chapter. However, digitalisation also poses potential limitations or risks to accessibility, due to users' lack of knowledge, capacity or access to the appropriate technology. Over-reliance on technology to resolve access issues could result in exclusion for different user groups and geographic environments (see Chapter 6 of this report).

While traditional public transport should form the backbone of a sustainable mobility offering in many contexts, it is not always a viable solution, particularly for places with low population density, or for users who cannot feasibly access it. In these cases, digitally enabled taxis and ride-hailing services can provide a mobility safety net (UITP, 2023).

Previous ITF work has highlighted how, in many countries, limited transport options in rural areas hinder access to basic services, jobs and social activities. To improve accessibility for these populations, several countries are developing novel ways to provide economically viable, affordable, inclusive and sustainable mobility in contexts where private and conventional public transport struggle to provide appropriate connections (ITF, 2021).

In Finland, a sparsely populated country of approximately 5.5 million people of which more than 72% reside in urban areas (see Figure 6), only a few bigger cities have the conditions necessary for efficient public transport in its traditional meaning. While there is no obligation for competent authorities to provide traditional public transport services, some vulnerable user groups have a legal right to access mobility services.

Figure 6. The urban-rural classification in Finland, 2018

Urban-rural classification (2018)
- inner urban area
- outer urban area
- peri-urban area
- local centres in rural areas
- rural areas close to urb.
- rural heartland areas
- sparsely populated rural areas
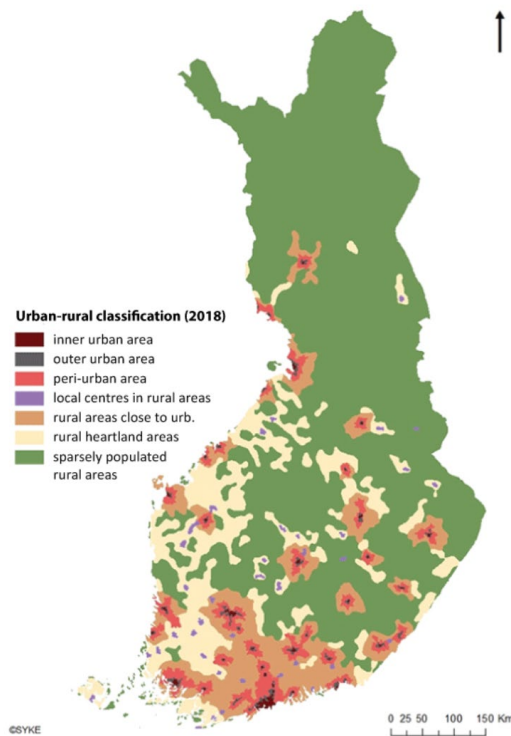
Source: Finnish Environment Institute (2020).

In 2020, Finnish public funding for mobility services totalled EUR 1.186 billion per year, with a roughly 50-50 split between public transport and travel imbursements for selected groups (36% of which goes to traditional taxi services).

Finland faces several significant challenges in organising subsidised passenger transport in rural areas. The cost of journeys for vulnerable user groups provided for by the *Finnish Disability Services Act* and the *Health Insurance Act* is projected to increase significantly and the planning of subsidised services is fragmented. No single entity is responsible for the overall co-ordination of such services at the local, regional or national level, hampering delivery optimisation. Furthermore, service procurement models vary considerably across competent authorities, and taxi services are very limited in sparsely populated areas.

The Finnish government aims to develop public transport services as a whole and ensure efficient use of public funding. Several possible measures have been identified to reach this goal, including:

- making better use of data to plan and improve the quality of services by developing a centralised national database of customer needs and availability of services to reduce overlapping work between competent authorities, thus generating cost savings

- better co-ordinating publicly subsidised transport with market-based service offerings by facilitating necessary information flows and the formation of travel chains

- using co-ordinated public procurement between competent authorities to generate sufficient demand to incentivise the development and growth of innovative market-based approaches to address rural accessibility (Government of Finland, 2023).

This approach is broadly consistent with findings from recent ITF research on approaches to enhancing rural mobility informed by 80 case studies across 20 countries. The research recommended adapting

tender and operator licensing requirements to allow local taxi, demand-responsive and community transport providers to bid for public service contracts in rural areas (ITF, 2021).

In North America, competent authorities are also exploring closer partnerships with private-sector operators of ride-hailing services to overcome accessibility challenges.

Innisfil, Ontario in Canada is a small, rural local authority with a sparsely distributed population of around 43,000. No traditional public transport services operate in the area. To enable an alternative to private vehicle travel, the local authority has (since 2017) partnered with Uber, a prominent digital ride-hailing platform, to offer a partially subsided on-demand taxi service. The average subsidy per trip is CAD 14.72, resulting in an average per-trip cost for users of CAD 4-6. Approximately 30 trips are undertaken each month with an average waiting time of seven minutes for an average trip distance of 13.5 kilometres. For Innisfil, this has proven to be a good-quality, cost-effective solution to the challenge of providing a viable alternative to private vehicle travel in rural areas – a model that may also bear fruit in other similar geographical contexts (Uber Transit, 2023).

Similar public-private partnership models can be deployed to improve sustainable accessibility for vulnerable user groups. In the United States, the Dallas Area Rapid Transit (DART) which does not regulate taxis or ride-hailing, has established a demand-responsive transport service to improve accessibility for people with reduced mobility which is supplement by taxi and ride-hailing operators (UITP, 2023). A hybrid fleet of 36 DART minibuses (dedicated vehicles) and a flexible number of Uber Pool vans (non-dedicated vehicles) offer trips ordered through DART's GoPass app, the Uber app, or by calling DART's service number. Approximately 70% of trips are taken with DART's dedicated vehicles, with the remaining 30% through Uber, using a flexible contract model where DART only pays for rides actually taken with Uber (no fixed costs). According to Uber, this model has reduced per trip costs from USD 16 to USD 5, with an average wait time of 5-15 minutes, leading to a 120% increase in ridership (Uber Transit, 2023).

These examples illustrate the potential efficiency gains and improvements in service levels that astute partnerships between local authorities and private sector ride-hailing operators can generate to overcome common mobility challenges and enhance sustainable accessibility, particularly for vulnerable user groups.

Policy takeaways

- Accessibility must be considered in terms of sustainable access to opportunities, which is influenced by a combination of factors related to communities themselves (and their diverse needs and abilities) as well as the areas in which they live. In addition to the physical presence of opportunities, the availability and attractiveness of the means to access them is important.

- The objectives of policies relating to sustainable accessibility need to be clear. Both sustainability and accessibility can be addressed through interventions, but the actions may vary. For example, the installation of a new sustainable mobility service that increases accessibility for those disadvantaged by the existing transport system may also need to be accompanied by incentives or other measures to encourage a change of behaviour among those choosing to use less sustainable alternatives.

4. Modal frameworks and accessibility indicators can help with planning

Single-issue research can help with raising awareness but is not particularly functional for designing interventions or planning strategies that must cater to communities that vary according to person-based metrics, and territorial and modal factors. This chapter explores two possible approaches: mobility guarantee frameworks, which document and map available modes and possible barriers to their use in an area, and accessibility indicators, which allow the use of person- and territorial-based factors to understand how well different groups can access opportunities.

Mobility guarantee frameworks

For conventional public transport, reliability is one of the key parameters for attractiveness. A comprehensive review of the literature has indicated that "reliability" takes into account many factors including experience in the vehicle, at the stop and ahead of the trip, as well as adherence to the schedule (Alkubati et al., 2022). Reliability is also a factor explaining why people may choose to use ride-hailing services.

In general, the dependability of a transport option will have an impact on people's choice to use it, or to depend on it. In this regard, private vehicles (e.g. cars, motorcycles and bicycles, and other two- and three-wheelers), and walking have a significant advantage over collective motorised modes. While walking, cycling and micromobility can all be relied on for trips up to certain distances, making the switch away from individual motorised vehicles attractive requires any alternatives to be dependable.

Minimum service-level guarantees or guarantees for taxi-like rides for those with mobility impairments or who cannot commute at times when scheduled services operate in the main public transport network, do exist in some regions. The concept of a mobility guarantee takes this approach one step further. It seeks to take account of overcoming barriers faced by the public rather than a specific cohort of people. The mobility guarantee framework provides mobility options, and their limitations, by sustainable means of transport that work as an alternative to individual motorised modes (see Figure 7).

Figure 7. Mobility service guarantee mapping

	Temporal constraint	Transport modes		
		Non-motorised modes	Motorised modes	
			Non-conditional	Conditional
Private modes	(24/7)	Walking / Cycling		Cars — *V, A, L* / Motorcycles — *V, A, L*
Vehicle sharing	Vehicle	Bike-sharing		Car-sharing — *A, L, R* / (E-)Scooter-sharing — *A, L, R*
Co-organized modes	Vehicle & Driver	(N/A)	Taxi, Chauffeur, Ridehailing / Carpooling	
Public modes	Schedule	(N/A)	Public transport	Demand-responsive transport — *R*

Extension of guarantee (socio-economic dimension) and desirable behavioral change (environmental dimension)

Codes for conditions
V: vehicle ownership
A: age
L: driving license
R: reservation

Transport modes
- Focus modes for Sustainable Mobility Guarantee
- Supplementary modes for Sustainable Mobility Guarantee
- Out-of-scope for Sustainable Mobility Guarantee (de-facto guaranteed and/or carbon-intensive)

Source: Shibayama and Laa (2023).

The Flächendeckende Mobilitäts-Servicegarantie (FLADEMO) project has examined the different potential legal structures and governance levels that could come into play in the case of a mobility guarantee (Shibayama, 2023; Laa et al., 2023). The work has identified that transport strategies, such as sustainable urban mobility plans (SUMPs) and sustainable regional mobility plans (SRMPs), could provide initial avenues for setting targets and objectives. This process of target-setting would then act as a transition to a legislative basis for the guarantee.

Strategies such as SUMPs could be developed by a regional authority, whereas legislation would be national. One of the crucial issues related to rural accessibility (outlined in Chapter 3 of this report) is that business models for modes in lower-density regions remain uncertain, making a legal guarantee difficult to define nationally.

However, this is an area where a combination of policies, measures and actions could play a significant role in better advancing the network of sustainable alternatives in rural contexts. For example, regional authorities, service providers and users could operate under national-level policy frameworks and programmes. Well-informed regional strategy and pilots could also help identify the nature of what is being guaranteed.

Accessibility indicators

Proximity of opportunity can be subjective. Two people living at the same address may not necessarily have the same level of accessibility, depending on their personal circumstances. According to a recent report by [KiM]: "If accessibility is a policy goal, indicators are needed to evaluate whether this goal is being achieved" [translated from Dutch] (KiM, 2023). Accessibility indicators provide a means of quantifying and visualising accessibility to address the issue of common "language" in different fields involved in

accessibility improvement. They can help identify gaps and communicate accessibility issues for different groups. They can also help monitor the progress of accessibility policies.

Accessibility indicators can combine various aspects, including financial and non-financial costs (e.g. time consumption), the distribution of points of interest (so-called "valued destinations") and land-use mix, and the perception of transport costs (i.e. how far is "far" away) (ITF, 2017). They may also address temporal aspects (e.g. peak/off-peak travel patterns for shift workers) and person-based metrics (although these require significant data).

Recent ITF work on accessibility suggests indicators can help identify gaps in provision, communicate potential issues with access to opportunities, and evaluate interventions (ITF, 2017, 2019, 2021 and 2023; Martens, 2020). Accessibility indicators can also help measure the distribution of impacts, as the available data sources are richer than they were in the past. Generally, indicators need to reflect a wide selection of modes, not just the conventional public transport modes and schedules. The objective of a specific indicator also needs to be clear. For example, an indicator might aim to evaluate sustainable modes or inclusive access.

There is no consensus on a single best approach to accessibility indicators, although many methodologies focus on urban analysis, which would need to be broadened out for application to different geographies. However, regardless of the methodology adopted, it is necessary to ensure that the indicators are tailored to the appropriate level of government for the analysis and that that governance level is able to act on the results of the analysis (ITF, 2021). National governments can lead the way by providing guidelines on the assessment and approval of interventions, including equity considerations (ITF, 2023).

Working Group participants discussed the possibility of combining sustainable mobility frameworks (e.g. mobility guarantees) with accessibility indicators to help evaluate how far policy makers should go in terms of providing or subsidising public services. This possibility was considered in the context of freedom of choice in terms of where people live. This would be a topic for further research but points to a potential further use for both accessibility indicators and modal frameworks or hierarchies.

Case studies

The nature and extent of use of accessibility indicators varies considerably across different cities, regions and countries. The following examples illustrate distinct approaches used in a large metropolitan area with a developed public transport network; a mid-sized metropolitan area aiming to better manage high private vehicle dependency; and a geographically small country with high population density.

Greater London, United Kingdom (population 8.8 million)

In London, the Mayor's Transport Strategy 2018 (amended in 2022) sets out policies and proposals to reshape transport across Greater London over a two-decade period. Implemented by Transport for London (TfL), the central objective of the strategy is to change the way people travel. The aim is that, by 2041, 80% of all trips will be made on foot, by bicycle or using public transport.

The strategy uses the "Healthy Streets Approach", which makes health and personal experience the priority for transport planning, with a particular focus providing good public transport services while improving accessibility for new homes and jobs as the city grows (TfL, 2018). To achieve the outcomes sought in the Mayor's Transport Strategy, TfL has developed and maintains various accessibility indicators which can be categorised into four distinct groups. These are:

1. access to the public transport network (or Public Transport Access Level, PTAL)

2. access through the network (measuring location-based catchment statistics)

3. access through the network (measuring London-wide catchment statistics)

4. access through the network to specific opportunities and services (Inayathusein and Cooper 2018).

For any location in London, the PTAL indicator combines walk access time to public transport with service availability at network access points (e.g. metro/rail stations, bus stops) within a given catchment. A public transport access index is calculated from this data and allocated a level, where PTAL 0 represents the lowest and PTAL 6b represents the highest level of connectivity. Figure 8 shows markedly different accessibility levels between inner and outer London.

Figure 8. Public Transport Access Level map of Greater London
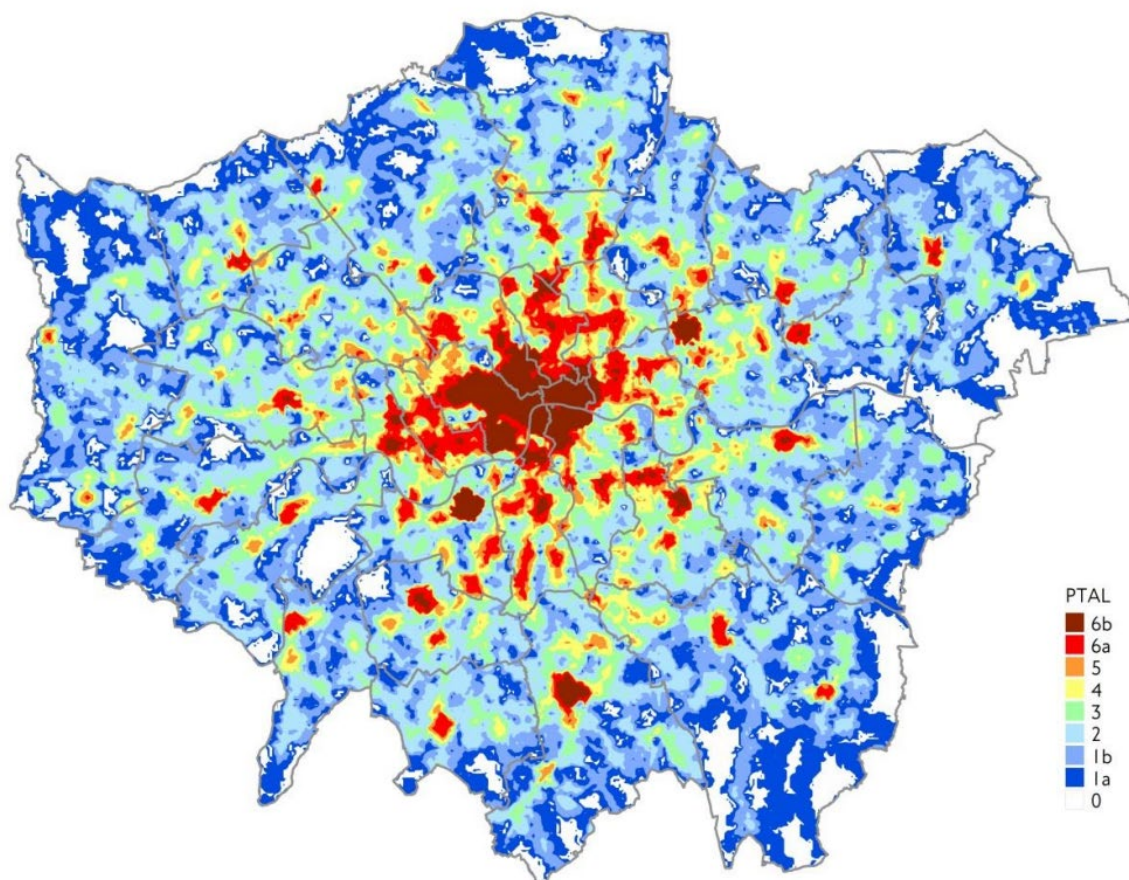
Source: Inayathusein and Cooper (2018).

The PTAL is TfL's most widely used accessibility indicator, having been adopted in the early 2000s and embedded in strategic planning processes through the "London Plan" – a statutory spatial development strategy for the Greater London area which guides decisions on planning applications by local councils, or boroughs, and the Mayor's Office. Specific use cases of the PTAL include:

*   prioritising the location of high-density employment generators in areas with PTAL ratings of 5 or above

*   relating housing densities to PTAL ratings where areas with good public transport provision (i.e. higher PTAL ratings) can support higher housing densities

- restricting car parking provision in areas with a high PTAL rating (Inayathusein and Cooper, 2018).

The second and third groups of accessibility indicators used by TfL focus on using travel-time mapping and associated catchment data to provide an assessment of connectivity, either by all public transport modes, or a specific mode, or by car. The second indicator generates travel time plots for individual locations for use at a more granular project assessment level, while the third aggregates travel time for zones across London for strategic planning (see Figure 9).

Figure 9. Jobs reachable within 45 minutes under the Mayor's 2041 Transport Strategy

Jobs in 45 minutes of zone
- > 2.5
- 2.0 to 2.5
- 1.5 to 2.0
- 1.0 to 1.5
- 0.75 to 1.0
- 0.5 to 0.75
- 0.25 to 0.5
- < 0.25
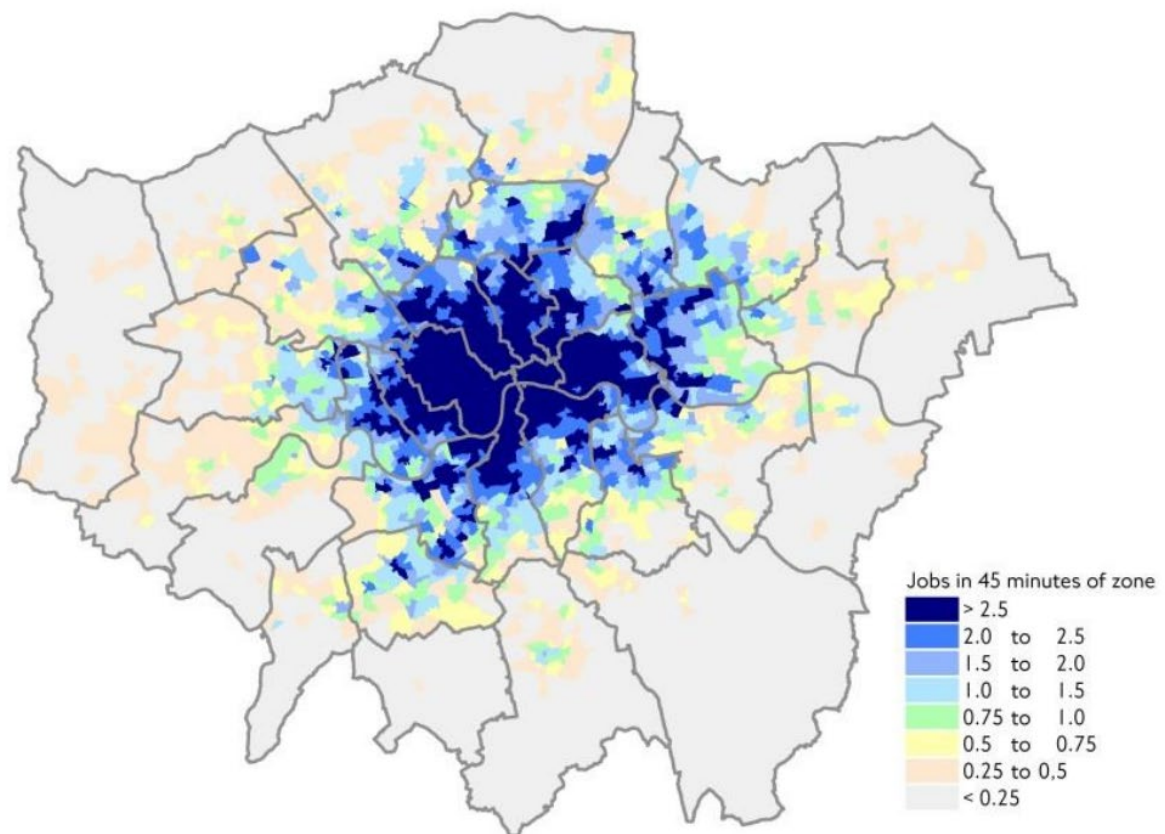
Source: Inayathusein and Cooper (2018).

The fourth indicator, named Access to Opportunities and Services (ATOS), was developed by TfL in response to a 2007 UK Department for Transport (DfT) initiative requiring local authorities to publish accessibility indicators (DfT, 2014). The ATOS indicator measures access to discrete points of interest or services (e.g. schools or medical centres) within a set travel time.

Figure 10 shows ATOS scores based on average travel time to the three nearest secondary schools for each zone in London by walking only, or by walking and public transport. In this example, category A corresponds to an average travel time of up to nine minutes, while category E corresponds to an average travel time of over 23 minutes (Inayathusein and Cooper 2018).

Figure 10. Access to the three nearest secondary schools by public transport and/or walking
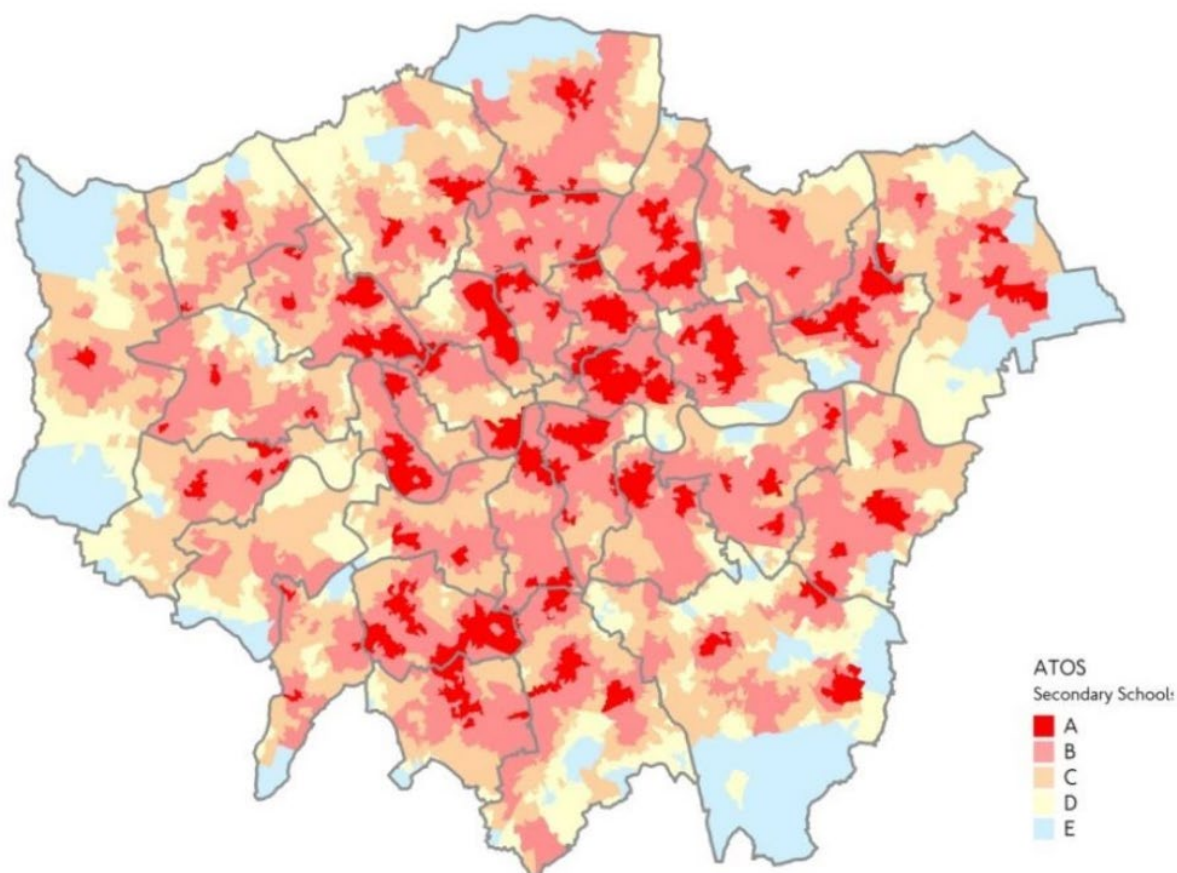
Source: Inayathusein and Cooper (2018).

Finally, to bring together various accessibility indicators into a single interactive mapping application for professional planners and the public, TfL has developed and published a tool called WebCAT (TfL, 2023). WebCAT offers two principal ways of measuring accessibility: the PTAL indicator, and location-based travel time mapping/catchment analysis (Inayathusein and Cooper 2018; TfL 2023). Users can select discrete parameters for a chosen location, including scenario year, mode (all public transport, cycle, step-free access), time period (morning, inter, and evening peak), user group (e.g. working age population, pensioners), and service location (e.g. town centres, educational establishments, medical centres).

Auckland region, New Zealand (population 1.7 million)

Transport planning and investment across the Auckland region in New Zealand reflect a partnership approach between the national and local governments, with several organisations involved including the Ministry of Transport, Waka Kotahi NZ Transport Agency, the NZ Treasury, KiwiRail, Auckland Transport, and Auckland Council.

Inequity of access to public transport services is a major consideration in investment and planning decisions. The Western and Southern areas of Auckland have less rapid and frequent transit services than central suburbs. Additionally, certain members of the community – particularly Māori, Pasifika and LGBQTI+ people, and people with disabilities – typically experience less equal access to transport.

Auckland Transport's Regional Land Transport Plan (RLTP) sets out the land transport objectives, policies and measures for the Auckland region for 2021-31. The RLTP addresses four major challenges:

1. Climate change and the environment. Emissions and other consequences of transport harm the environment and contribute to the transport system becoming increasingly susceptible to the impacts of climate change.

1. Travel options. A lack of competitive travel options and high car dependency as the city grows limit the ability to achieve the quality compact urban approach for Auckland.

2. Safety. The transport system has become increasingly harmful and does not support better health outcomes.

3. Access and connectivity. Existing deficiencies in the transport system and an inability to keep pace with increasing travel demand limit improved and equitable access to employment and social opportunities.

These four challenges reflect the region's substantial ongoing population growth, a challenging natural setting and historical approach to land use, a legacy of under-investment (particularly in public transport and cycling), ageing roads and transport facilities, and global threats.

Figure 11 sets out the measures and indicators the RLTP uses to assess progress in addressing the "Access and connectivity" challenge using a combination of modelled and real-world data sources. It focuses on expected results from RLTP implementation, as well as what is considered necessary for improved outcomes but requires additional funding or policy tools. In implementing the RTLP, Auckland Transport undertakes regular monitoring and reporting to inform the Regional Transport Committee of local government representatives, in accordance with the *New Zealand Land Transport Management Act* (Auckland Transport, 2021).

Figure 11. An example of accessibility indicators used in Auckland, New Zealand

Source: Auckland Transport (2021).

The Netherlands (population 17.9 million)

Since 2008, the Government of the Netherlands has merged funding for infrastructure and spatial development, setting out a Multi-Year Programme for Infrastructure, Spatial Planning and Transport (MIRT), and an accompanying framework of rules for planning, programming and budgeting processes (Geurs, 2018).

The MIRT includes projects and programmes for the built environment. It takes a collaborative approach to development between the national and regional governments. The programme is principally led by the Ministry of Infrastructure and Water Management, with contributions from other ministries, provinces, municipalities, transport regions, district water boards, non-governmental organisations and businesses (Government of the Netherlands 2018; Heers et al., 2012).

The MIRT process includes different phases encompassing exploratory studies, planning studies, and project construction and management/maintenance. During the exploratory phase, analysis is undertaken at the regional level to explore potential interventions, involving national, regional and/or local governments. During the planning phase, social cost–benefit analysis is carried out to examine the economic efficiency of proposed investments (Geurs, 2018). See Figure 12 for an example.

To date, national and regional transport policy and planning processes as encapsulated by the MIRT have primarily relied on infrastructure-based accessibility indicators, with objectives targeting traffic congestion, travel speeds, travel time reliability and service levels (e.g. public transport service frequency).

Figure 12. The Dutch Multi-Year Programme for Infrastructure, Spatial Planning and Transport
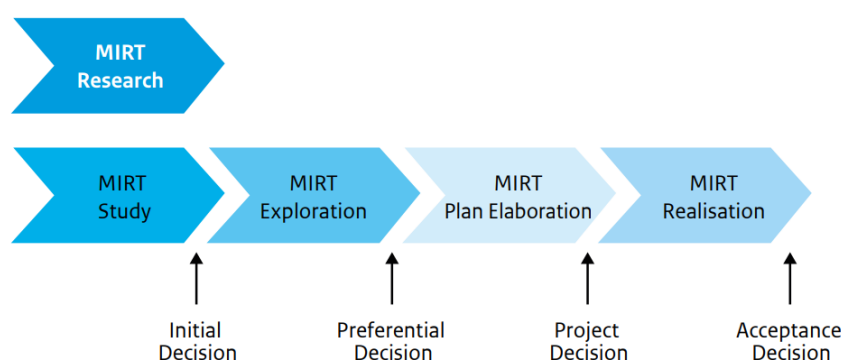
Source: Government of the Netherlands (2018).

At the national level, efforts have been made to streamline the use of accessibility indicators for regional studies and project appraisal. The National Policy Strategy for Infrastructure and Spatial Planning (which sets out a vision to 2040 for the development of spatial planning and mobility policy across the Netherlands) prioritises the integration of indicators across all modes to provide insights on the standard of accessibility enjoyed by different transport users (Government of the Netherlands, 2013).

More recently, consultation on the Government's "Mobility Vision 2050 Framework Memorandum" (2023), which focusses on creating a more integrated national accessibility policy, resulted in parliamentary motions to investigate setting a minimum accessibility standard for key social and economic facilities (e.g. education, healthcare and employment clusters). National and regional government agencies are now examining which accessibility objectives and indicators would be most appropriate to implement this approach (Government of the Netherlands, 2023).

Policy takeaways

- Use accessibility indicators to broaden the scope of project appraisal, identify areas to target and communicate impact of transport policy in accessibility to policy makers and wider stakeholders. This is an area for further research (see Annex A). Develop accessibility indicators that are appropriate to the scale of governance they are being used at and for the objective they aim to achieve. National governments could develop guidance and associate resources for the research and development of national and local indicators appropriate to their contexts. This should include expanding accessibility indicators beyond urban settings.

- Develop a hierarchy or framework of sustainable modes based on desirable travel behaviour. Use this framework to inform accessibility and equity analyses. Use the results of these analyses to inform strategies and intervention design. Frameworks, such as mobility guarantees, are important strategies for identifying and overcoming accessibility barriers. These could build towards the concept of an accessibility guarantee, or accessibility by design, focusing on proximity and walkability, could go beyond this by decreasing the dependency on means of transport that might be discriminatory.

5. Incorporating accessibility in governance

> Both national and local government should have responsibilities for the development of accessible transport and infrastructure. The balance between the two will differ [from one country to another] (ECMT, 2006).

What kinds of intervention, at which level of government, are needed to make accessibility a reality? Purely top-down, highly centralised approaches to governance featuring generalised policies (Matland, 1995) could undermine the need for more nuanced understanding of accessibility. At the same time, solely bottom-up approaches can reflect a greater understanding of what is happening on the ground, but risk being unable to generate sufficient support (and, by extension, risk being omitted from resource allocations).

Sustainable accessibility can be viewed in the context of a "wicked problem", according to the "wicked" and "tame" framing described by Rittel and Webber (1973) and further developed in the literature (see e.g. Head 2008; Peters 2017).

In the case of sustainable accessibility for all, the problem cannot be clearly defined at the level at which it needs to be solved and in fact requires integrated action at multiple governance levels. There are myriad factors involved that differ by socio-economic, socio-demographic, socio-cultural and territorial contexts, with the intersection of these factors creating yet further nuances. There is likely to be no single solution, or single set of solutions, that can be stipulated by governments to solve the issues.

Successful resolution will rely on co-operation between different levels of government, and with different stakeholders, which will differ from place to place. Fostering trust and a shared understanding, including through meaningful engagement and communication, will be important. This chapter outlines the different roles for different levels of government and discusses processes for incorporating meaningful engagement.

National and regional or state governments

National governments are responsible for setting national regulations and stipulating the standards under which all subsequent actions will be governed. With regard to ensuring access for persons with disabilities, a joint task force of the European Conference of Ministers of Transport (ECMT) and the International Association of Public Transport (UITP) (2006) concluded that the role of national governments in setting out legislation "requiring the provision of fully accessible public transport" was crucial to creating a framework "within which local authorities and transport operators can work together to achieve accessibility" (ECMT, 2006).

Many governments have gone on to implement regulations to ensure physical access is reflected in transport planning. However, over time the concept of accessibility has expanded, as described in previous chapters, and legislation has not always kept pace. Indeed, even solely within the physical access domain, regulating for the range of groups in need of provision has faced challenges in the past. For example, the onboard transport infrastructure required for wheelchair users is not the same as the need for assisting blind and/or partially sighted people. Moreover, there is a chance that accessibility requirements might

need careful balancing, an example being the bus/train space needed for wheelchairs which could reduce the seating space required for other priority groups such as elderly people or pregnant women (ECMT, 2000).

Legal provisions for accessibility have also extended to setting or guaranteeing minimum levels of service at a regional level in some countries. The Swiss cantons of Zurich and Bern have minimum level-of-service requirements based on the size of the community (Hinchcliff and Taylor, 2021). The government of Catalonia, in Spain, guarantees minimum levels of intercity connectivity for communities of different sizes in the region (ITF, 2021).

There has been some move to establish legislation covering broader accessibility requirements. The government of the Flanders region of Belgium legislated in 2001 for minimum public transport levels of service based on priority residential areas, the location of stops and service frequency. In 2019 it introduced the Decree on Basic Mobility, which moved the focus of planning from the services to the people using them. The transport network is now structured in layers, from mass transit corridors for rail (layer 1) down through, four layers of gradually more local needs to first- or last-mile solutions, such as taxi and demand responsive solutions.

The Flanders regional government has introduced a (non-regulatory) regional mobility plan to complement the Decree on Basic Mobility and provides funding in the form of project subsidies. However, 15 local transport regions, and their councils, are responsible for implementation. These local councils include representatives of key mobility stakeholders such as transport operators, the highways agency and local municipalities. The decree also provides for local-level consultations (Government of Flanders, 2019; ITF, 2021).

National governments also set strategies for mobility and accessibility. Although these strategies may not include the explicit levels of service regulations of other instruments, they set targets and create the policy frameworks within which local stakeholders can collaborate and act. For example, Austria's 2030 Mobility Master Plan (Government of Austria, 2021) provides guidance and sets targets for the transport sector in Austria to achieve climate goals (set by a legally binding directive). The plan incorporates the results of a back-casting exercise based on achieving net-zero in 2040.

Austria's Mobility Master Plan focuses on access to (sustainable) transport modes but also, indirectly, on equal, non-discriminatory access to opportunities. The plan is being accompanied by a review of all transport and mobility laws at the federal level with a view to ensuring climate protection is included in sectoral transport law. Draft legislation "will provide the legal tools to achieve the targets and measures of the 2030 Mobility Master Plan" (Government of Austria, 2021: 45).

In Canada, the *Accessible Canada Act* came into effect in 2019. This law aims to remove barriers to the full participation of persons with any disability or impairment by 2040 (Government of Canada, 2019). This law has acted as the basis for several follow-on agencies and actions that will be vital to the implementation and monitoring of the Act's ambitions. For example, Accessibility Standards Canada (further discussed in the section on meaningful engagement) was established to develop standards for all federally regulated sectors and environments (Accessibility Standards Canada, n.d.). Likewise, Statistics Canada was charged with developing a framework of performance indicators for monitoring the progress in the different priority areas. A subsequent set of indicators is also planned to monitor the removal of attitudinal barriers (Employment and Social Development Canada, 2023).

Ireland's National Sustainable Mobility Policy provides a strategic framework for improving walking, cycling and the use of public transport, and sets targets for additional sustainable trips and reductions in vehicle-kilometres for fossil-fuel cars by 2030 (Government of Ireland, 2022a). The strategy includes clear

directions on the principles for informing the design of interventions (see e.g. Figure 13, which shows the hierarchy of road users). The policy is accompanied by a shorter-term action plan which clearly identifies the roles of different actors and levels of government.

Under the National Sustainable Mobility Policy, the Irish Department of Transport's actions mainly focus on strategic infrastructure (rail and road networks); reviewing or developing relevant legislation or standards; providing funding to local authorities for various aspects of implementation; and promoting or providing guidance on core principles, including "access for all". Its role also includes managing pilot programmes to test new principles and organising capacity building or awareness raising among relevant stakeholders (Government of Ireland, 2022b).

Figure 13. Ireland's Hierarchy of Road Users model
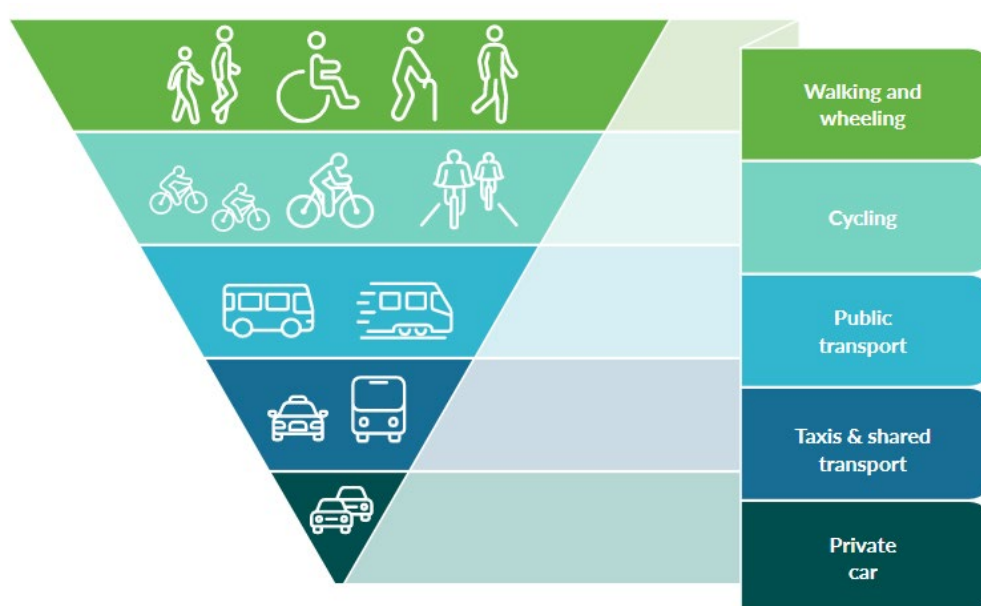
Source: Department of Transport, Ireland.

In Ireland, the National Transport Authority (NTA) is responsible for funding public service obligation agreements and manages all such agreements as well as public transport contracts (NTA, n.d.). The NTA also stepped in to encourage innovation in the provision of accessible bus services by issuing a call for tenders for low-floor, single-deck coaches. The NTA developed the vehicle specifications and managed the full procurement exercise. A framework agreement was signed with the winning bidder, allowing the NTA to purchase accessible vehicles at a larger scale, which are then operated by service providers on designated routes (Government of Ireland, 2023).

The Indian Government also conducted an aggregated procurement exercise (including subsidies) under its Faster Adoption and Manufacturing of Electric Vehicles (FAME) scheme. The scheme was developed to support the purchase of electric and hybrid buses on behalf of local governments and cities to help them overcome the high capital costs of renewing their bus fleets (UITP, 2020). While procurement exercises such as these are not without their challenges (UITP, 2020), they enable national or regional governments to use their procurement powers to advance strategic goals and support local authorities or agencies that may not have the resources to do so themselves.

> **Box 3. The future of public transport funding**
>
> transport is crucial to a low-carbon transport future. Public transport trips must be maintained and expanded, and fleets will need to transition to low or zero-emission vehicles. Additionally, public transport will need to form the backbone of the transport network in peri-urban areas, complemented by other modes. The loads carried by future public transport networks will therefore be considerable.
>
> A recent ITF Working Group report found that all means of revenue generation for public transport will need to be optimised in the future. It recommends:
>
> - funding public transport as a crucial part of a sustainable, decarbonised and accessible transport system
>
> - formulating integrated funding strategies for future public transport services
>
> - ensuring effective co-ordination between levels of government when funding public transport investments
>
> - improving the efficiency of public transport infrastructure investments and service provision
>
> - adopting explicit fare policies and implement them via formal processes
>
> - using structured fare policies for more equitable accessibility.
>
> Source: ITF (2024).

Developing national strategies consumes considerable resources. One complete, long-term strategies can prove inflexible in the face of unexpected changes, such as demographic changes in regions experiencing short-term changes in migration patterns. For example, accessibility for refugees or temporary protection seekers will be based on the interaction between many different factors, and governments may need to take reactive measures at short notice. While local government engagement, as well as bottom-up and top-down communication, can support efficient responses to such new circumstances, this is an area that would benefit from greater research on access and governance.

Even with a high-level policy goal in place, implementing it across the levels of government can run into barriers (see Box 3 for an example). The Ambiguity–Conflict model of policy implementation (Matland, 1995) seeks to conceptualise the relative success of policy implementation to identify whether top-down or bottom-up approaches may be most appropriate (see Table 1). It does so by focusing on two dimensions: 1) the degree of conflict between actors on the goal, its urgency or the means of delivering it; and 2) the level of ambiguity around the outcome to be achieved and /or ambiguity around the means of delivering those outcomes. Ambiguity can be a drawback in a top-down process, as it makes prescribing solutions more difficult. However, it can also allow space for learning and developing better solutions (Matland, 1995).

Table 1. The Ambiguity–Conflict model of policy implementation

Low Ambiguity–Low Conflict	Low Ambiguity–High Conflict
Implementation through provision of adequate resources	Political implementation, reliant on power differences
High Ambiguity–Low Conflict	**High Ambiguity–High Conflict**
Experimental implementation, allowing space to learn and, hopefully, improve. Success will rely on the engagement of stakeholders and the availability of resources (contextual conditions).	Symbolic implementation, wherein the high level of ambiguity allows the actors to form coalitions around their interpretations of the symbolic goal. This implementation is likely to lead to differing results in different locations, as the interpretations of the goals vary in line with local needs and priorities.

Source: based on Matland (1995).

Policy conflict can occur even within groups that are ostensibly looking to achieve the same goal. The ability to deliver this goal depends on the relative power of the different actors to persuade or coerce others, and the availability of resources (Matland, 1995). Top-down approaches can work well where there is low ambiguity on what is being delivered. But in cases where there the goal, or means of delivering it, are less clear, allowing elements of bottom-up learning and development can be more effective for success (Froschauer, 2010).

Froschauer (2010) examined the application of different policy implementation models to a bus rapid transit (BRT) project in South Africa. The research identified the Ambiguity–Conflict Model as most appropriate because "it does not discard other approaches, but rather seeks to determine which approach may be most appropriate for successful implementation" (Froschauer, 2010: 66). It also found that variance between BRT sites increased ambiguity, as did the co-ordination (or lack-there-of) between the different implementation tools, with different locations implementing different versions of BRT.

Furthermore, a wide range of stakeholders with differing objectives (even within the overall goal of delivering the BRT system) added to the level of conflict around the implementation in this case. The author concluded that implementation represented a high conflict–medium ambiguity case, wherein the difference in power between the actors would be the deciding factor, and that the main implementation mechanism was therefore political. However, the author's identified preferred experimental model of implementation would also require potentially greater resources and time than the project had available.

Regional authorities and local governments

Implementation is best catered for by local authorities and the transport operators (ECMT, 2006; ITF, 2020). In several of the examples mentioned above, detailed planning or implementation was the responsibility of local governments or local authorities. In Flanders, the 15 local transport regions are responsible for developing their own mobility plans, as well as ensuring cross-boundary co-operation with other regions (ITF, 2021). In Germany, the Federal Government conducted analysis on transport accessibility of public transport and active modes, as well as organising a participative process for public engagement. However, regional authorities are responsible for taking the work forwards and developing accessibility standards (BVDI, 2018). In such cases it is important to ensure appropriate awareness and skills at the regional level to take planning forwards in a way that recognises the needs of people in the region.

France's 2019 *Loi d'orientation des mobilités* (mobility orientation law, LOM) established regional transport authorities (autorité organisatrices de la Mobilité, AOMs). Expanding on previous urban planning entities, AOMs can organise urban and non-urban mobility within their region, depending on their make-up (Brown, 2020). This new method of organising mobility governance moves away from centralised decision making stipulating the services that must be provided. Instead, AOMs can develop plans and provide services based on what they evaluate as most effective for their region. However, AOMs in sparsely populated regions will receive special advice from the French government on mobility planning (ITF, 2021).

In the United Kingdom, the *Greater London Authority Act* (1999) devolved powers for some functions, including the planning and operating of public transport, to the Greater London Authority (GLA). TfL is a statutory body created to carry out the functions of passenger transport provision, road safety, traffic reduction and traffic signal management. TfL is also the Highways Authority for the strategic GLA roads, which account for about 5% of London's road network (TfL, n.d.).

Transport strategy for London is set out in the Mayor's Transport Strategy, a statutory 25-year transport strategy that guides TfL's activities for the duration of its validity. A new Mayor's Transport Strategy can be issued after a mayoral election, which take place every four years (TfL, n.d.). London is also divided into 33 local authorities, which act as local highways authorities for the roads in their borough (excluding GLA roads). The local authorities are required to prepare Local Implementation Plans (LIPs) detailing how they will deliver the strategy in their areas, subject to the Mayor's approval (UK Government, n.d.). TFL then manages funding support to the boroughs to deliver their LIPs (TfL, n.d.).

In Austria, each regional government is obliged by law to establish a *Verkehrsverbund* (public transport association) as a special-purpose company. The associations work as pseudo-public bodies to integrate different financing sources for public transport and demand-responsive (or on-demand) transport including fare incomes and budget from the education sector for obligatory transport services for schools. They also co-ordinate fares and timetables of different services, and work as a primary regional "orderer" of public transport services to operators, managing public procurement.

Small local governments in Austria intending to provide local transport services can delegate planning and service procurement upwards to the regional *Verkehrsverbund*. This allows local governments lacking in expertise or dedicated resources to organise locally tailored transport services. Some *Verkehrsverbünde* work as the primary entity responsible for national and regional pilots, testing innovative solutions such as integrated transport information platforms and new mobility services.

In New Zealand, Auckland Transport aggregates transport responsibilities from across the Auckland region's eight former councils and the Auckland Regional Transport Authority. It has responsibility for all functions and operations related to transport, except for state roads (Auckland Transport, n.d.). Auckland Transport contracts public transport infrastructure and manages infrastructure. It is also responsible for improving road safety and encouraging more sustainable travel choices in Auckland.

Meaningful engagement

How can transport policy makers engage meaningfully with their populations to ensure solutions are designed based on representative feedback? In April 2022 the ITF conducted a workshop on accessibility and civic engagement under the auspices of the ITF Corporate Partnership Board. The workshop focused on how to improve the inclusiveness of transport policy making and published findings on how better transport (accessibility) policy could in turn improve that engagement (see Box 4).

> **Box 4. Accessibility and civic engagement**
>
> **Transport options shape people's lives**. The transport options available and affordable to different neighbourhoods and user groups can impact employment, education, economic and social mobility opportunities. Transport decisions can lead to access gaps and create, or reinforce, inequity among different communities and social groups. Transport needs evidence-based decision-making to ensure a good fit for those who use the system.
>
> **Evidence-based decision-making needs good data.** Better data can also support a greater understanding of transport needs by sociodemographic groups and demand patterns. This data is not always available, or collected specifically for the purposes of transport planning. Engagement across stakeholder groups, and breaking down traditional organisational silos, can help to gather greater spatial data and understanding of communities.
>
> **There is a need to recognise the voices missing from transport discussions**. Adopting a variety of channels to reach-out to different potential user groups and those impacted by transport decisions can help improve the representativeness of the engagement. When planning outreach and engagement activities, there is a need to think of accessible venues and information formats beforehand (for example, wheelchair friendly buildings, childcare facilities at meetings, etc.). Enabling engagement from different groups of society can help policymakers and planners identify potential pitfalls at the design stage, before implementation begins.
>
> **Diversity in the transport labour-force can support more inclusive decision-making**. Diversity in the transport sector's workforce, particularly in decision-making roles, can support better awareness of different needs when planning transport policies and system design. Training for planning professionals could also help to improve awareness of the different issues facing different sectors of society at the planning stage.
>
> **Two-way communication can help to engender confidence in the process**. Once mechanisms have been set up to engage with target user or social groups, it is important to provide feedback to those citizens who have spent their time and effort to provide input. Without it, there is a risk that participants in such exercise would not see value in further engagement activities. While one-off meetings can help to reach various groups, establishing working groups can also help ensure a longer dialogue between different stakeholder groups. This can help evaluate policy impacts and therefore address some accountability gaps in the governance sphere of transport planning.
>
> **Commercial entities can also adopt civil engagement practices.** For example, with new mobility modes (i.e. e-scooters) and safety considerations for other users of public spaces, the discussion heard of the concept of safety boards established for all groups to have the opportunity to raise their concerns.
>
> Source: ITF (2022).

For many years, governments have sought to improve the reflection of different viewpoints in their policy making through the engagement of expert panels. In the United Kingdom, for example, the Disabled Persons Transport Advisory Committee (DPTAC) was established in 1985 to provide advice to the Department for Transport (and the Office of Road and Rail) on policy development, proposals and decisions, act as a "sounding board" and make recommendations on research directions.

DPTAC has a standing membership of 10 to 20 members, each of whom serves for three years. At least half of the members are required to be persons with disabilities. The Committee must meet at least four

times per year (UK Government, n.d.). As a non-departmental body of the UK Government, DPTAC was subject to a review of its form and existence in 2010. Based on that review and public consultation, the government concluded that it should continue operating (UK Parliament, 2013).

A more recent example of advisory committees comes from the United States, where the Transforming Transportation Advisory Committee advises the Secretary of Transportation on transport innovations, including "[p]athways to safe, secure, equitable, environmentally friendly and accessible deployments of emerging technologies". The committee members are expected to serve two-year terms and will comprise "safety advocates, labor, technical experts (e.g., automation, data, privacy, cybersecurity), and industry representatives" (US DoT, n.d.).

In 2019, the Government of Canada established a body, Accessibility Standards Canada, to develop accessibility standards for all federally regulated entities to ensure accessibility for all persons with disabilities. The body's remit covers all areas of accessibility, but transportation (regulated federally), built environment and access to goods and services are included among their priorities. The standards are developed by technical committees that include those with lived experience of disability as well as industry and experts on the relevant fields. The standards will be voluntary, however, there is scope for them to be adopted as regulations (Accessibility Standards Canada, n.d.).

In recent years, some governments and authorities have begun to adopt broader citizen participation to engage a more representative sample of the population in decision-making and design processes. Participative processes across all sectors have become more common in the last decade, and the OECD has developed dedicated guidelines on citizen participation (OECD, 2020).

Beyond traditional forms of information sharing or discussion fora such as town hall meetings, or standard public consultations, some other techniques have begun to be used by authorities looking to engage citizens in decision making. Participatory budgets, for example, have become more prevalent since their first use in Brazil in 1989. This method gives citizens the power to directly influence budget policy and allocations (OECD and CEUP, 2020; UN DESA, 2022). The UN Committee of Experts on Public Administration (CEPA) describes participatory budgeting as having the potential to be "a process that helps to localize the Sustainable Development Goals (SDGs) at the community level" (UN DESA, 2022).

Although the Participatory Budgeting World Atlas (2019) has identified both national and regional-level instances worldwide, in some regions there are no national-level exercises noted, while regional or city-led instances have been recorded in every region (n.d.). However, global challenges such as poverty, social exclusion and climate change cannot be comprehensively tackled at the micro-scale alone without macro-scale strategies by governments and industry actors.

Lee and Min (2023) estimated that participatory budgeting in Korea had a positive impact on investment in some sectors, including transport. However, it also skewed investments towards short-term deliverables and away from long-term solutions (Lee and Min, 2023). The ITF has recommended the use of longer-term, vision-led planning for transport systems to help strategically align investment in sustainable systems, and as some insulation against uncertainty (ITF, 2021; 2023a; 2023b).

In the long run, trends towards short-term decisions could undermine the sustainable development of transport systems if investments are made in a piecemeal fashion. This underlines the importance of the choice, design and management of the process being well informed. CEPA at the UN, and the OECD working with the European Commission, have developed guidance on the use of participatory budgets (OECD and CEUP, 2020; UN DESA, 2022).

Innovative solutions, such as the collection of data through crowdsourcing or hackathons, have also been seen in transport. In Mexico City, where there was a dearth of data on existing bus routes, the city

authorities used gamification to improve their knowledge. This crowdsourcing initiative, known as Mapatón, was led by the mayor in conjunction with a consortium of partners in a larger project to improve urban planning. An NGO then organised a hackathon using the data collected and included experts of relevant disciplines. The data-collection exercise was estimated to have cost the city authorities a fraction of the cost of traditional mapping exercises (OECD, 2016).

Other tools for involving citizens in data collection include citizen science and civic monitoring. The latter involves the citizens in the evaluation of an intervention after it has taken place (OECD and CEUP, 2020). Behaviour change will also be an important part of any strategy, with interventions needed to encourage people to choose the most sustainable modes available. Such measures can be politically challenging to implement but will be crucial to improving the sustainability of the transport system.

The OECD maintains a database of representative deliberative processes for all sectors. Of the 31 case studies related to transport or infrastructure planning, 10 were implemented at the regional or national level (see Table 2), and 21 at the local government scale (see Table 3). The processes used for the transport sector in the database are citizens' juries, citizens' dialogues, citizens' councils, planning cells and deliberative polls, with the citizens juries being the most common (OECD, 2021). Ultimately, the process chosen should be decided based on the complexity and scale of impact of the policy problem.

Table 2. Participative processes for transport policies at the state or regional level

Deliberative model	Nature of topic being put to public	Country
Citizens' Jury	Consultation on highway planning	Spain
Citizens' Jury	Consultation on highway planning	Australia
Citizens' Jury	State transport insurance policy	Australia
Citizens' Jury	Development of regional transport plan	Canada
Citizens' Jury	Development of regional transport plan	Canada
Citizens' Jury	Long-term strategic planning for funding	Canada
Citizens' Jury	Long-term strategic planning for road / PT use payments	Australia
Citizens' Jury	Long-term strategic planning for state	Australia
Citizens' Dialogues	Priorities for state transport spending	USA
Citizens' Council	State level priorities for mobility planning next 10 - 15 years	Austria

Source: OECD Database of Representative Deliberative Processes and Institutions (2021).

Table 3. Participative processes for transport policies at the local government level

Deliberative model	Nature of topic being put to public	Country
Planning Cell	Discussion of specific interventions for amenity space	Japan
Planning Cell	PT problems in a specific city region	Germany
Planning Cell	PT solutions for a specific city ward	Japan
Planning Cell	Feedback from local residents impacted by a specific intervention	Germany
Deliberative poll	Transit and Traffic issues in a specific city	Argentina
Deliberative poll	City level infrastructure planning	Mongolia
Citizens' Jury	Solutions for PT, congestion and air quality in Cambridge city	United Kingdom
Citizens' Jury	Design of a specific intervention in Vancouver	Canada
Citizens' Jury	Decide whether to build a metro in a specific city	South Korea
Citizens' Jury	Design of a specific intervention in Toronto	Canada
Citizens' Jury	To gather input on impacts on a community of growth at a specific airport	Canada
Citizens' Jury	Informing service design and network development in a specific region	Canada
Citizens' Jury	Help development of footpath planning in specific city (Toronto)	Canada
Citizens' Jury	Developing plan for complementary measures in the communities immediately surrounding a freight terminal	Australia
Citizens' Jury	Developing plan for local infrastructure in a specific city	Australia
Citizens' Jury	Development of an infrastructure plan for a specific city	Australia
Citizens' Jury	Development of an infrastructure plan for a specific city	Australia
Citizens' Jury	Prioritisation of infrastructure interventions for a specific city	Australia
Citizens' Dialogues	Looking at revenue for infrastructure development in a specific city	Canada
Citizens' Dialogues	Development of the urban mobility plan for a specific French city (Amiens)	France
Citizens' Dialogues	Development of the urban mobility plan for a specific French city (Grenoble)	France

Source: OECD Database of Representative Deliberative Processes and Institutions (2021).

Consistent with the remits described in the previous section, regional and state level governments have primarily conducted the processes in relation to strategic planning, such as highway networks and budget allocation. Local governments have conducted processes on specific interventions or transport plans, together with the communities that will be impacted by them. This is a very relevant point considering the discussion in Chapter 2 of this report – the specific spatial impacts for individual communities are mostly assessed through engagement at the local level. Box 5 outlines two examples of local-level processes.

> **Box 5. Examples of representative deliberative processes in transport policy making**
>
> **Citizens' juries**
>
> In Vancouver, Canada, a community panel was assembled to consider the routing of an arterial road through their community that would also cross a railway line, to support community connectivity and safety. The independent panel comprised 42 individuals drawn from the community and was designed to reflect the demographics of the community, based on age, gender and ethnicity. The panel considered several possible routes for the road, taking on board presentations from 50 others and inputs from a further 200 participants, and ultimately made recommendations to the city council and the parks board, both of which contributed funding for the exercise (community flats full report). The Jeffersen Centre managed the four-month process, which involved seven meetings (Jeffersen Centre, 2019a).
>
> The recommendations from the panel were then incorporated into the deliberations of the city council and parks board in identifying the final route alignment. The panel did not select the first proposed alignment, which had an estimated cost of CAD 400 million, but they did select the second preference route (estimated at CAD 125 million) recommended by the panel. At the same time, the council approved "a pilot project to improve walkability and reduce vehicle speeds along Prior-Venables, as well as increase permanent park space in the area", aimed at addressing key concerns raised by the participants through the community panel process (Jeffersen Centre, 2019a).
>
> In a post-process survey, the majority of respondents (sample size = 36) were satisfied with the process and found the information presented useful. The majority also responded that the city council should consider using the process more often (Jeffersen Centre, 2019). "Even if we didn't always agree with one another, we are now more able to understand one another and those whose experiences and perspectives differ from our own" (Jeffersen Centre, 2019b).
>
> **Deliberative polls**
>
> In Buenos Aires, Argentina a survey (nearly 1 500 participants) and follow up one-day discussion (62 participants), were organised to understand transit and traffic issues in the La Plata area. The process threw up several conflicting viewpoints, but also saw specific areas for action identified (e.g. the restoration of five bus lines) and statistically significant changes in opinion. The process also saw trust in the government and mayor increase significantly, with 68.9% of discussants saying they had confidence in the mayor and his government "to do the right thing" and 80% of discussants thought the exercise was worthwhile (Deliberative Democracy Lab, 2009).

The OECD Guidelines for Citizen Participation Processes

The OECD has developed Guidelines for Citizen Participation Processes, which include a ten-step pathway for citizen participation (OECD, 2020; see also Box 6). The Working Group considered the guidelines in the context of transport systems, and it is important to note that the citizen participation process discussions that follow are distinct from the mandatory consultations required in a transport project.

The OECD guidance recommends that citizen participation takes place throughout the course of a project. However, it is especially important in the early stages of concept development and design to ensure proposed solutions reflect the needs of the relevant community and support "social sustainability" (OECD, 2021). The experience in Ireland in developing guidelines for community engagement by public authorities emphasises the importance of this early, and ongoing, engagement to build relationships with the

community (Government of Ireland, 2023). Although the recommendations in that report focus on infrastructure construction (see Table 2 and Table 3), there is scope for meaningful engagement in strategy and planning projects too.

A crucial element in the citizen participation process is to clearly identify the problem the public is being asked to help solve. From there, it is possible to identify the correct point(s) in the project process at which to engage with citizens (OECD, 2022: 10). This is particularly relevant in transport, as there are often several layers of authorities and agencies involved in the planning and delivery of transport interventions, sometimes with conflicting viewpoints and priorities. The Working Group highlighted that making the appropriate intervention at the appropriate level of governance is important. The OECD guidance on citizen participation (2022) provides a clear tabulation of the options and reasons for each of the processes which can assist in this process (see Annex B).

For a successful citizen participation process, it is imperative to identify upfront the resources needed to deliver it. The organising body should be fully committed to the process and plan to commit the necessary resources (OECD and CEUPT). Time should also be invested in identifying which voices are needed to participate. Relying solely on existing representative groups with which relationships exist risks continuing to overlook certain people (Government of Ireland, 2023). This can be particularly a risk for the most vulnerable groups.

In the later phases of the process, feedback to the citizens involved and the wider public is very important to contribute to transparency. It also signals to participants that their time invested in the process was worthwhile. As part of this, authorities must clearly communicate the outcomes of the process and how those results were used or considered in the overall decision-making process (OECD, 2022; ITF, 2022).

Box 6. Ten steps for a citizen participation process

1. Identify the problem to solve and the moment for participation

2. Define the expected results

3. Identify the relevant group of people to involve and recruit participants

4. Choose the participation method

5. Choose the right digital tools

6. Communicate about the process

7. Implement the process

8. Use citizen input and provide feedback

9. Evaluate the participation process

10. Cultivate a culture of participation

Source: OECD (2022).

Policy takeaways

- National governments must identify sustainable accessibility as a priority so that it can feed into all strategies, governance frameworks, investment priorities and planning processes that follow. Building on the discussion in Chapter 1, these strategies must include more than just the transport sector and should reflect integrated thinking with development planning. Collaboration across departments is therefore very important to achieving accessibility objectives.

- Different levels of government have different competencies and relevance to the desired outcomes. National governments have the power to create the mandate and guidance at a national level. They should set the principles or strategies that councils should be operating under. Regional and local authorities are likely to be better placed to understand the circumstances facing the residents and visitors in their region and should be supported by national governments to take forward implementation.

- National governments should define funding mechanisms for delivering the necessary transport schemes and participative processes as appropriate. They can define conditions for receiving national money on the regional and/or local level, such as setting sustainability and social equity goals for any funded projects or bodies. Impact monitoring can also help identify successful interventions and help future funding decisions. Depending on the population size, establishment of dedicated institution or team at the regional or local level would be an option if such an institution does not yet exist. A framework should be provided by national governments.

- Improve engagement with the people impacted by the decisions, consider the tools available (e.g. as detailed in the OECD guidance on citizen participation processes). The exact form of this engagement will depend on what is most appropriate for the context. Improved data collection will also aid more informed decision making and support monitoring the effectiveness of any measures implemented in how well they are delivering against equity and inclusion goals.

- Tools exist to consult citizens at a high level on strategies or strategic interventions. Equally, community-level schemes can inform local-level project designs and investments. Engagement at these two levels of governance can provide strategic direction and, potentially, define funding. Furthermore, specific local projects or interventions could help accessibility in those communities – given the combination of socio-economic, demographic and territorial factors that prevail in local settings.

6. Looking beyond mobility policy

Accessibility is a question of more than just the provision of transport modes. While transport planning has in many places focused on achieving accessibility through physical mobility, integration with land-use planning has been insufficient, as has the recognition of the increasingly prominent role played by digital connectivity (Lyons, 2015; Handy, 2020; ITF, 2020).

This chapter sets out an emerging approach to transport planning that aims to incorporate the land-use system and digital connectivity more holistically into the policy development process while taking account of future uncertainty about societal mobility preferences. It explores how applications of digital mobility technologies and developments in land-use practice, particularly in the form of mobility hubs, can affect sustainable accessibility in urban, peri-urban and rural settings.

Better integrating land-use and digital connectivity into transport planning

Triple Access Planning for Uncertain Futures is a three-year research project carried out between May 2021 and April 2024 that sought to quantify and schematise these inter-relationships. Involving academics, city authorities, national transport authorities and private consultants in Italy, the Netherlands, Slovenia, Sweden, and the United Kingdom, the project aimed to enhance guidance for SUMPs for both passenger and freight movements through two additional significant considerations:

1. conceiving accessibility through the tripartite lens of the transport system (physical mobility), the land-use system (spatial proximity), and the telecommunications system (digital connectivity)

2. a greater focus on explicitly taking into account multifaceted uncertainty in the development of plans, stemming from variables such as demographics, economic developments, locational choices, regulatory context, technological breakthroughs, travel demand, and stakeholder behaviour (Triple Access Planning for Uncertain Futures 2023).

The Triple Access Planning approach builds on insights derived from a New Zealand Ministry of Transport strategic project undertaken in 2014 to consider future demand for mobility through the use of scenario planning (New Zealand Ministry of Transport, 2014).

Triple Access Planning seeks to explicitly recognise the two and three-way interactions between the transport system, land-use system, and telecommunications system (see Figure 14). Each is an enabler of economic and social activities, with their associated resource requirements and negative externalities.

Global disruptions in recent years have brought into sharper focus the need to fully consider the interactions between each of these three sub-systems. For example, during the Covid-19 pandemic, much of the world adjusted to home-working/shopping/education/socialising, and restrictions limited travel beyond immediate neighbourhoods. This demonstrated how an unexpected shock can shift the relative dominance of physical mobility for access to opportunities towards digital connectivity and spatial proximity.

Figure 14. The Triple Access System
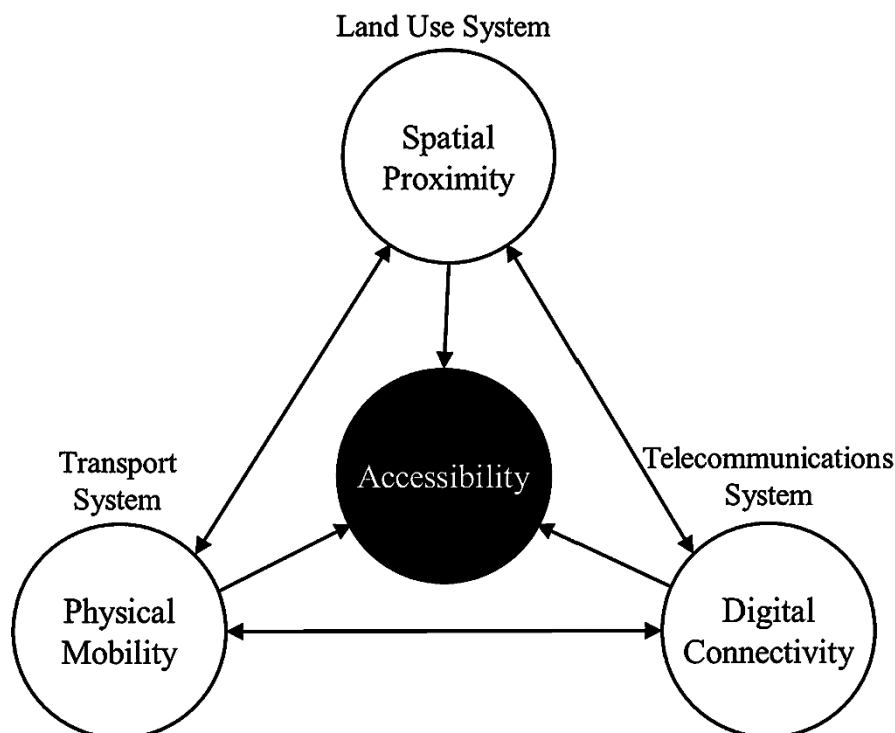
Source: Lyons and Davidson (2016).

Furthermore, as addressing climate change has moved up policy agendas in most countries, the "Avoid, Shift, Improve" paradigm for decarbonising transport has undergone some modifications, with additional focus placed on the "Avoid" (demand management), and "Shift" (mode shift) pillars. This transformation adds further weight to the role of land-use and telecommunications systems in achieving sustainable accessibility (ITF, 2024c).

The Triple Access Planning approach is also couched in the "decide and provide" paradigm advocated for in several recent ITF publications (ITF 2021c; 2023a; 2023b), which involves making investments that are strategically aligned to a preferred vision of the future transport system, while taking uncertainty into account through scenario planning.

1. Three recent projects have adopted vision-led approaches to specific aspects of accessibility, demonstrating the ways in which interventions could conceivably be combined. Scotland's 2020-2022 National Transport Strategy Delivery Plan is an example of a project focused on physical mobility, which aims to develop a co-ordinated package of policy interventions to reduce car kilometres travelled by 20% by 2030 compared to pre-pandemic levels (Transport Scotland, 2020).

2. The "15-minute city" concept, which focuses on spatial proximity, was a centrepiece of the 2020 mayoral election campaign in Paris (City of Paris, 2022).

3. The Welsh Government's long-term ambition to see around 30% of Welsh workers working from home or near from home in the post-pandemic era clearly focuses on digital connectivity (Government of Wales, 2020).

Aligned with these types of projects, both the concept of desired density (of population and amenities) and the idea of clusters of amenities, are emerging in academic discussions as measures to achieve more accessible settlements.

While conceptually attractive, the Triple Access Planning framework faces several significant challenges. First, the complexity of the system, the number of pertinent variables, and the potential lack of available data make quantifying and modelling demand and supply interactions for physical mobility, spatial proximity and digital connectivity under different scenarios challenging. Similar, and perhaps even more pronounced, challenges are likely to exist when incorporating the Triple Access Planning approach into individual project appraisal processes (ITF, 2020). Related to this is the fact that effective implementation of the framework could require additional skillsets in public authorities.

Finally, the success of Triple Access Planning is predicated on different parts of government sharing information and working effectively across complex and busy portfolios. The organisational distribution of responsibilities across central and local government departments can make this very difficult, and indeed efforts to align transport and land-use planning more closely through organisational reform has not always led to better outcomes (Handy, 2020).

For example, in the United Kingdom, voluntary local enterprise partnerships between local authorities and businesses identify and act on local economic growth priorities. The integration of these partnerships with transport authorities has led to greater recognition of the role of mobility in fostering positive agglomeration effects to support economic development (Marsden and Docherty, 2019). Similarly, significant steps have been taken to align transport and public health interventions more closely within local government across Great Britain (Heath, 2014; Government of Scotland, 2008).

However, despite clear aspirations to enhance cross-sectoral collaboration between agencies, it remains difficult to achieve in practice. This is in large part due to ongoing pressure on public sector funding while demand for services increase, making resource allocation to anything other than core operating activities difficult (Maguire et al., 2016). To improve synergies across government in a resource-constrained environment, policy practitioners could aim to highlight the potential for expenditure in one sectoral area to save costs in another related sector, to help build the case for detailed collaborative discussion and action (Mueller et al., 2016; Greener Journeys, 2016).

Digitalisation and access

Since the release of the first widely consumed smartphone 15 years ago, the use of digital travel information and services has become ubiquitous in many ITF member countries (Aguilera, 2019). A recent study by KiM Netherlands Institute for Transport Policy Analysis (Durand, Hamersma and Rienstra, 2023) found that 96% of respondents to an online survey use digital forms of travel information (see Figure 15). While the Netherlands has a relatively digitally skilled population, and an online survey is likely to underrepresent people who use digital tools infrequently, these findings could be expected to be broadly equivalent for many other similar ITF member countries.

Figure 15. Uptake of smartphones and use of digital travel information in the Netherlands
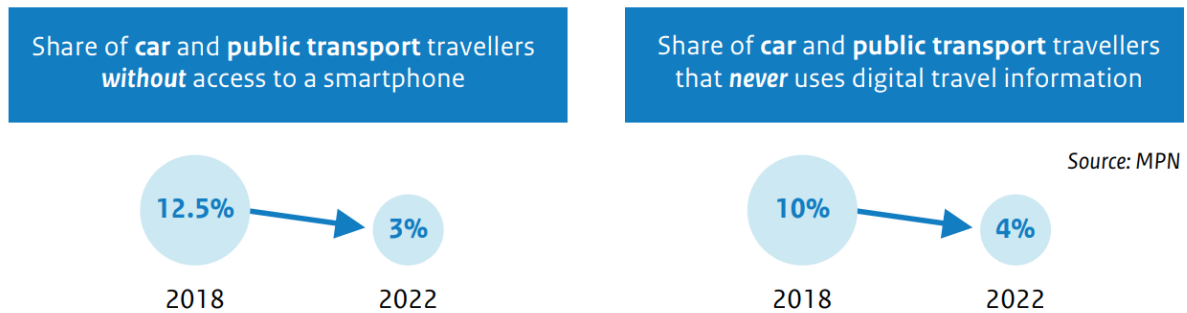
Source: Durand, Hamersma and Rienstra (2023).

The same survey revealed that, in 2022, 75% of car and public transport users found travel without a smartphone to be more difficult, with only 37% of respondents considering road signs or signs in public transport to be sufficient in facilitating worry-free travel (see Figure 16).

Figure 16. Digital tools are indispensable in mobility
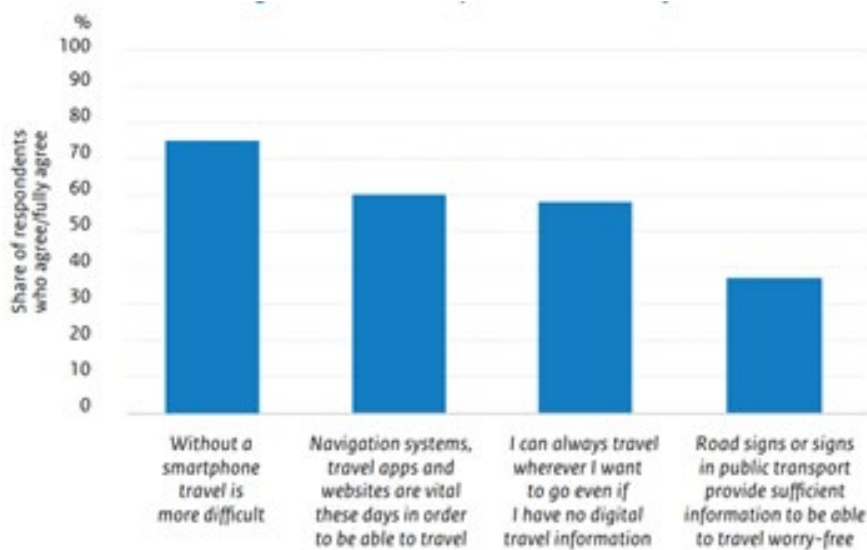
Source: Durand, Hamersma and Rienstra (2023).

The use of digital travel information contributes to increased traveller convenience for both car and public transport users, with perceived journey time-savings, greater certainty regarding potential disruptions, and increased adaptability to vary route and departure times in comparison to analogue travel information. However, the impact of digital travel information on safety (a key enabler of accessibility) and sustainability are mixed (Durand, Hamersma and Rienstra, 2023).

While digital travel information and other digital services offer many benefits for transport users, not everyone is willing or able to take advantage of them. Research on digital inequality for mobility is in a nascent stage, but a 2022 review of 25 published papers on the topic revealed that vulnerability to digitalisation in transport services is particularly acute for older adults, women, people with lower education levels, with lower income levels, from ethnic minorities, and rural areas (Durand et al., 2022).

Furthermore, these findings have proved consistent across multiple countries where the impact of digital inequality have been studied on particular user groups (Bertolaccini and Hickman, 2019; Carney and Kandt, 2022; Bigby et al., 2017).

Exclusion from digitalisation can occur both due to inequalities in material access to quality technology, and from inequalities in sufficient digital skills to harness it. In the Netherlands, for example, an online survey found around 8.5% of car and public transport users have no access to a smartphone with sufficient mobile data or battery and storage space to adequately use digital information services. The same survey found around 9% struggle to use travel apps or websites to plan and execute a journey, with paper-based surveys in Spain and Germany finding closer to 20% of the population experience difficulties (Durand, Hamersma and Rienstra, 2023).

Experiencing difficulties in access and application of digital services does not always result in vulnerable users failing to use them. Coping strategies, in particular support from individuals' social network, plays a major role in facilitating use, although the extent of such support varies greatly and typically leads to effectively raising the generalised cost (more time, money, and/or effort) of travel for these people (Durand et al., 2022; Bertolaccini and Hickman 2019). This can result in vulnerable users becoming even more dependent on others as mobility services become increasingly digital (see Box 7), contributing to driving some people from public to private means of transport, potentially reinforcing patterns of social inequality (Durand et al., 2022; Lucas, 2019).

Box 7. Making MaaS accessible for all

Mobility as a Service (MaaS) has garnered significant attention internationally as a mobility solution. Most research on the MaaS concept has focused on its potential to enhance the efficiency or sustainability of urban mobility systems, possible governance models, challenges related to regulatory approaches, and data architecture. However, there has been relatively little written on how the implementation of MaaS can be made accessible for vulnerable user groups (ITF 2021a; 2023; Dadashzadeh et al., 2022; Dadashzadeh, Sagmanli and Ouelhad, 2022; Durand et al., 2018; Ho et al., 2020; Matyas, 2020; Reck and Axhausen 2021).

Research to date has found that age, gender, income, education, and current travel behaviour all play an important part in determining an individual's propensity to purchase MaaS packages (Matyas and Kamargiani, 2021). The proportion of the population considered as vulnerable transport users (particularly older adults, people with disabilities, lower-income groups, and people with digital illiteracy) has increased in recent decades, and is projected to continue to do so. This means that designing inclusive MaaS platforms will be important for widespread uptake of more sustainable transport and access to social and economic opportunities (Pangbourne et al., 2020; Polydoropoulou et al., 2020; Alyavina et al., 2020; Kyiakidis et al., 2020).

Work to better understand accessibility and MaaS has begun to pick up. For example, a study funded by the UK Department for Transport and led by the University of Portsmouth has developed a "MaaS Inclusion Index" which aims to evaluate a given MaaS platform at the service level rather than city/area level, to help guide stakeholders in enhancing accessibility for vulnerable user groups. The framework groups different aspects of accessibility for MaaS into three sub-indexes which look at the accessibility of the transport services, the accessibility data available on the services, and the accessibility of the MaaS interface itself. Researchers (Dadashzadeh et al., 2022; Dadashzadeh, Sagmanli and Ouelhad, 2022) identified the following main aspects necessary to include in the evaluation: physical accessibility

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of the transport services; collection and availability of data on accessibility; and accessibility of the integrated mobility services platform.

Public transport passes such as the KlimaTicket in Austria (implemented 2021), parallel card-based and app-based ticketing offers such as the Deutschlandticket in Germany (implemented in 2023) and the Climate Card in Seoul, Korea (pilot planned for 2024) demonstrate that integrated subscription-based passes are not only possible through smart-phone apps.

Combining app- and non-app-based approaches could potentially enhance the inclusiveness of vulnerable users and improve their access to MaaS-type services. This area requires further investigation as ticketing products evolve.

The potential role of mobility hubs

A "mobility hub" provides a focal point in the transport network that seamlessly integrates different modes, especially public transport, shared, and active mobility. It also combines supportive multimodal infrastructure with other policy goals such as charging points and placemaking strategies. The idea builds on earlier concepts used in the literature and planning practice focussing on transfers in the passenger transport domain (e.g. park and ride facilities, multi-modal transfer centres) and in the freight logistics domain (e.g. urban and regional distribution centres).

Table 4. The functions of mobility hubs

Mobility Hub Function	Description
Multimodality (feeder mode)	Ability to use shared services (such as shared bike) as first/last mile mode (activity-end)
Multimodality (main-mode)	Ability to use shared services (car-sharing, micro-transit) at the hub in place of public transport
Multi-Activity Destination	Ability to perform multiple activities within the same location
Additional Function	Travellers using personal modes to access hub
Parking	Ability to park personal mode at the mobility hub

Source Tippabhatla (2020).

A well-designed hub maximises access to mobility and other resources, while ensuring a transfer between modes for first and last-mile connectivity (UITP, 2023a). The term is generally used to refer to the spatial connection of multiple mobility modes including shared mobility, offering a physical location for users to switch between modes (see Table 4).

Mobility hubs should act as the glue between the core network and local services, accompanied by initiatives to integrate trip planning and booking on a regional or national level. A convenient and affordable transport offer does not only improve access, but also provides the basis for incentivising more sustainable mobility behaviours.

A core element of strategic rural transport policy is multimodal rural mobility co-ordination (e.g. at the regional level) for more sustainable, convenient and seamless travel. Mobility hubs act as important links between the core network and local rural collective or shared services. Mobility hubs also offer possibilities

to integrate local services and businesses to make waiting times more attractive. The scale and range of services offered through hubs should vary according to location and population density (ITF, 2021).

A study assessing the impact of mobility hubs in Germany indicates that, after their introduction, residents became more aware of shared mobility services (Miramontes et al., 2017). With respect to modal shift, findings suggest that introducing mobility hubs increases the use of car-sharing and public transport (Miramontes et al., 2017). Tippabhatla (2020) analysed the roles of mobility hubs for travel behavioural change and concluded that shared mobility services offered in mobility hubs had an impact on travellers' choices. The study also highlighted their roles in terms of accessibility (Table 4).

A recent ITF report (ITF, 2022) emphasises equitable accessibility principles of mobility hubs to support mobility networks becoming more accessible and affordable for more people, and to promote liveable and equitable communities. Mobility hub typologies differ, particularly in relation to how they serve urban land, suburban and rural activity centres, therefore providing benefits to all types of communities. The primary objective of mobility hubs should be to facilitate improvements in how people access and use existing and new mobility services around settlements. This includes the ability to customise journeys for different customer segments including fully accessible journey options for those with disabilities (ARUP, n.d.).

A study conducted by Imperial College London, in partnership with Enterprise and Brompton Bike Hire, looked at the impact of offering employees free access to a car club or bicycle as an alternative to their own vehicle (Imperial College, n.d.). Another project, SmartHubs, looked at the accessibility and inclusiveness of mobility hubs as a key point especially in the context of traditionally less-well served users (e.g. older persons, people with reduced mobility, vision or cognitive abilities, people having no access to the internet, persons with low income, women, ethnic minorities, caregivers, children, foreigners), who might experience barriers to using mobility hubs (Geurs et al., 2022).

However, there is no comprehensive body of literature on the impacts of mobility hubs on mode choice and wider transport objectives such as emissions and congestion. SEStran (2022) suggests that the impacts should be monitored to build an evidence base for planning the future expansion or continuation of service provision. The study also suggests implementing a pilot project which evaluates the overall impact of the hub in terms of demand for services and travel behaviour change for the services offered to provide robust evidence of its impacts and estimated benefits.

Building a network of mobility hubs can be challenging. Strong leadership at the political and departmental level, a clear division of responsibilities between relevant stakeholders, an enabling regulatory environment, and co-ordinated branding and communication are all crucial to success. Furthermore, mobility hubs should ideally be implemented in a scalable network to facilitate sustainable multimodal lifestyles and an enduring shift away from private vehicle dependency. To achieve this, mobility hubs must be stable enough to balance the volatility of the shared mobility market and flexible enough to adapt to emerging needs. Finally, the role of mobility hubs in achieving improved accessibility outcomes should be fully integrated, and clearly communicated, in strategic planning documents of the relevant competent authority (UITP, 2023a).

Policy takeaways

- Accessibility goes far beyond transport policy, with cross-departmental consideration of the tripartite interactions between the transport system (physical mobility), land-use system (spatial proximity), and telecommunications system (digital connectivity) needed to both take account of

multifaceted uncertainty in societal preferences for access over time, and efficiently shift towards more sustainable travel options.

- While digital travel information and other digital services offer many benefits for transport users, not everyone is willing or able to take advantage of them. Investigating digital inequality and its consequences in a systemic manner is an important pre-requisite to designing policy and services that harness the efficiency gains of digitalisation while ensuring all user groups can reap the benefits. Investigate what options can be provided to improve inclusiveness.

- Mobility hubs should act as the glue between the core network and local services, accompanied by initiatives to integrate trip planning and booking on a regional or national level. The scale and range of services offered through hubs should vary according to location and population density, also considering leisure and tourism travel.

Conclusions

The concept of accessibility has grown beyond physical access and mobility. The term "sustainable accessibility" refers to the ease of reaching amenities and opportunities by using sustainable mobility options that are reliable, affordable, usable and non-discriminatory. The focus is on different groups of people, their needs and places they have to reach to conduct activities to fulfil them.

However, as understanding of the facets of accessibility has grown, implementation through governance processes has become more complex. Classification by individual factors (e.g. gender, income or geography) helps raise awareness of a variety of travel patterns that conventional transport planning has not always recognised, but each factor is too one-dimensional to fully address the needs and behavioural factors that affect sustainable accessibility. At the same time, it is unlikely that a solely top-down approach could succeed in defining the more granular understanding of the intersections between all the various facets needed to better understand mobility and sustainable travel choices. Additionally, given the impacts of territorial and socio-cultural factors, solutions cannot always be generalised across populations.

The principles identified by previous ITF work on accessibility still stand, even allowing for the expanded remit of accessibility interventions according to the broader concept of sustainable accessibility. Namely, accessibility will rely on co-operation across government levels and with public and private sector operators, as well as participation of different social groups in defining the necessary solutions. Full accessibility will rely on the existence of the right services, infrastructure technologies and strategic, integrated transport and land-use planning. Additionally, those strategies will need to reflect the fact that different societal groups have different abilities and ambitions. Implementation will require actions at every level of government, with different levels taking on different roles, from strategic direction to project design. Proper implementation should also include participation, communication and learning strategies that fit both stakeholders and citizens as specific target groups.

Involving communities and different societal groups in new governance processes will be important. Several methodologies have already been developed and applied to transport projects. Participative processes, such as those outlined in the OECD's Guidelines for Citizen Participation (see Annex B), can be useful in incorporating meaningful engagement at appropriate steps in the governance processes. Accessibility indicators, in combination with a mobility service framework or modal hierarchies, can help with understanding and communicating gaps in sustainable accessibility, although they will require greater amounts of data and guidelines on their application. Indicators can also be used for monitoring and communicating whether an intervention is successful. Data on demographics, service availability and travel patterns from various sources (e.g. public surveys, transportation agencies) can be leveraged for creating indicators. These indicators can be used for monitoring and evaluating the success of interventions.

Finally, mobility policy alone will not be sufficient to address sustainable accessibility. Different policy domains will need to come together, including land-use and development policies, and infrastructure and service planning (e.g. through the expansion of broadband infrastructure, or the location of schools and hospitals). National governments will need to signal the importance of sustainable accessibility as an outcome by including it as a priority in strategic planning documents and providing guidelines on how to achieve it across different levels of government.

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Annex A. Areas for further research

Working Group members identified a wide array of research and knowledge on sustainable accessibility, including case studies from ITF member countries and other contexts. However, the group also identified significant knowledge gaps. This Annex outlines some potential areas for future research.

Accessibility indicators

Researcher could consider developing guidance for more people-centred accessibility measurement that could be adapted by national and local governments. Indicators need to be adapted to reflect a definition of accessibility in rural and remote areas. Building on existing benchmarking for cities (see ITF, 2019) and work by the OECD on service delivery and well-being in rural areas (see OECD, n.d.) could also be beneficial.

Person-based metrics

Policy makers require greater understanding of (and better data on) different social groups and the interactions that affect their travel options and choices. International research can contribute to this understanding, but the context-specific nature of many travel choices suggests that national-level research is also needed. It is crucial to go beyond classical socio-demographic and socio-economic typologies, as value change leads to increasing diversity "behind" these classes. Multi-dimensional classifications are one useful alternative. Another could be to concentrate on socio-cultural variables, which can "enlighten" the internal diversity of classes. Unfortunately, this information is not covered by official statistics, which contributes to a lack of insights on the part of policy makers or planning administrations about the diversity of modern societies. Therefore, basic research is needed to develop proper typologies.

Participatory design

There is a need to look more closely at the integration of people of interest (i.e. persons with a disability, people living in rural areas, and any social group denied accessibility due to the four aspects of transport poverty outlined in Chapter 2 of this report) into the processes of defining and implementing accessibility, to make participatory co-operation possible at all levels. Participatory research and design are not easy to implement, and more work would also need to be done on how to introduce them in transport policymaking and find good ways to implement them.

Freedom of choice

The Working Group discussed this topic in the context of mobility service guarantees and where (or for whom) governments should guarantee or subsidise mobility services. In seeking sustainable accessibility, research on the topic would be especially relevant in contexts with (seasonal) influxes of visitors, who may be more heterogeneous than residents in terms of their needs and travel patterns.

Transport optimisation models

Traditional modelling approaches need to be updated to over a wider range of criteria.

"Leapfrog"

Research could contribute to identifying how regions experiencing economic and population growth could integrate sustainable accessibility into the design of their urban settlements and transport systems and avoid the entrenched car-dependency of many established cities. This would need to consider a sustainable development pathway that avoids high levels of motorisation leading to lower levels of accessibility during economic growth. Participation of experts from emerging economies will be necessary.

Sustainable business and funding models

Moving forward, addressing the challenge of funding sustainable accessibility solutions will be critical. Innovative financing models, such as public-private partnerships, can be explored. Additionally, emerging technologies like autonomous vehicles, if implemented with accessibility in mind, could hold promise for extending mobility options.

Environmental impact

Develop methodologies to assess the lifecycle environmental impact of various accessibility solutions, considering resource use, emissions and potential for end-of-life recycling or reuse. This would inform the design of solutions that minimise environmental footprint while maximising accessibility.

Cost-effectiveness

Analyse the cost-effectiveness of implementing different accessibility solutions across diverse contexts (e.g. developed versus developing economies, rural versus urban). Research should consider both upfront investment and long-term operational costs to identify the most sustainable and equitable approaches for various settings.

Technological advancements

Investigate how emerging technologies can contribute to sustainable accessibility. This could include research on integrating autonomous vehicles, electric micro-mobility options, and connected and data-driven traffic management systems into accessible transport networks. The research should explore how these technologies can be implemented in a way that is affordable, inclusive, and environmentally responsible.

Annex B. Extract from OECD guidelines for citizen participation processes

04 Choosing the **participation method**

Once the problem to solve (step 1), the expected inputs (step 2), and the public you would like to involve (step 3) have been identified, it is **time to choose the method of participation.** There are many different methods that can be used to engage citizens in any given context, and new methods are continuously developed and implemented. These guidelines include eight different methods that are widely applied across public institutions, but acknowledge that there other methods that public authorities can use for their participatory processes.

The summary of methods detailed below compares their key characteristics.

Participation method	To use when you are looking for...	Considerations	Types of inputs	Moment
ACCESS TO INFORMATION AND DATA Publishing information proactively and providing information reactively.	Ways to raise awareness about an issue or a public decision. Ways to keep the public informed about public decisions.	It is the very minimum that can be done. Should be used in situations where there is no room for citizens to have a say.	Promotes transparency, creates awareness about public issues, and creates conditions for more advanced participation.	Identification Formulation Decision making Implementation Evaluation
OPEN MEETINGS / TOWN HALL MEETINGS Gathering the public in face-to-face meetings with public authorities, in order to provide information and openly discuss topics of interest.	Ways to inform the public about public issues and decisions. Space to have a loosely structured exchange and receive broad initial feedback.	Allows for an exchange between public authorities and the public. Does not yield representative judgement or well-informed solutions.	Information sharing and broad feedback from citizens.	Identification Formulation Decision making Implementation Evaluation
PUBLIC CONSULTATION A two-way relationship in which participants provide feedback to a public institution (comments, perceptions, advice, experiences, and ideas).	Aggregated individual opinions and feedback from the public. Opinions about a policy debate, or a specific question Experts' feedback.	Adaptable to the needs, different methods (surveys, digital platforms, in-person discussions). Not statistically representative and can be difficult to process the inputs received.	Aggregation of individual citizens' preferences or grouped opinions from stakeholders.	Identification Formulation Decision making

OPEN INNOVATION: CROWDSOURCING, HACKATHONS, AND PUBLIC CHALLENGES Tapping into the collective intelligence to co-create solutions to specific public problems via crowdsourcing, hackathons or public challenges.	Ideas, and collective solutions to framed problems. Involve the public in developing solutions or prototypes.	Requires certain conditions and necessary resources for citizens and stakeholders to work on and develop solutions to public problems. Usually requires certain expertise from participants.	Collective ideation, co-creation of solutions, prototypes.	Identification Formulation Implementation Evaluation
CITIZEN SCIENCE Involving citizens in one or many stages of a scientific (or evidence-based) investigation, including the identification of research questions, collection of data and evidence, conducting observations, analysing data, and using the resulting knowledge.	Help collecting or analysing scientific data. Feedback or guidance on research questions and research design. Collaboration to implement science related projects.	Is suited for scientific endeavours rather than policy questions and dilemmas. Adaptable to the needs – covers a range of participation opportunities in science.	Varies from data collected to guidance on research questions and decisions to implemented citizen projects.	Identification Implementation Evaluation
CIVIC MONITORING Involving citizens in the monitoring and evaluation of public decisions, policies, and services. Civic monitoring can be considered as a social accountability mechanism.	Collaborative oversight and evaluation mechanisms for public decisions and actions. Ongoing monitoring of and feedback on a policy or a project. Community monitoring of a policy or a service.	It is geared towards receiving feedback from individuals during or after implementation. It requires to take into account feedback to improve services or policies.	Citizen feedback, opinions, suggestions.	Implementation Evaluation
PARTICIPATORY BUDGETING Mechanisms that allow citizens and stakeholders to influence budgetary public decisions through the direct allocation of public resources to priorities or projects or by being involved in public deliberations.	Help from the public to identify budget or resource allocation preferences. Ideas and projects from the public to be funded. Increased awareness and understanding of public spending by citizens.	Can yield either an aggregation of participants individual preferences (if takes the form of a voting), or their collective judgements (if it has a deliberative element).	Varies from ideas, projects, prioritisation, to binding allocation of public resources through vote.	Identification Formulation Decision making Implementation
REPRESENTATIVE DELIBERATIVE PROCESSES A randomly selected group of people who are broadly representative of a community spending significant time learning and collaborating through facilitated deliberation to form collective recommendations for policy makers.	Informed, collective public judgements about a complex policy issue. Recommendations that take into account a broad diversity of views. Legitimacy to take tough decisions.	Helpful when tackling complex, long-term policy issues. Can take place in different models ranging from shorter and smaller Citizens' Panels/Juries to larger scale, longer Citizens' Assemblies, or even permanent bodies.	Collective citizen recommendations, position, or judgement.	Identification Formulation Decision making Evaluation

Source: OECD (2022).

Annex C. List of Working Group participants

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Sustainable
Accessibility for All

Although the term "accessibility" is not new, it has become increasingly important in the transport policy discourse in recent years. This report explores the idea of "sustainable accessibility" as it applies to transport. It focuses on the needs of vulnerable demographics, including older persons, people with disabilities, low-income groups, and residents of urban peripheries, regional towns and remote areas. In doing so, the report looks beyond mobility policy to consider land-use and spatial planning, the growing digitalisation of economies, and their roles in securing accessibility for all.

OECD